Rock Products

$2.00 A YEAR CHICAGO JUNE 21, 1919

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VOL. XXII—No. 13
June 21, 1919

Rock Products seeks and reports everything of interest to producers of crushed stone, sand, gravel, lime, cement, gypsum products, agricultural limestone, phosphate, potash and glass sand. It spends many times more money than any other journal of the industry to compile its message every two weeks. Appreciate Rock Products.

Rock Products

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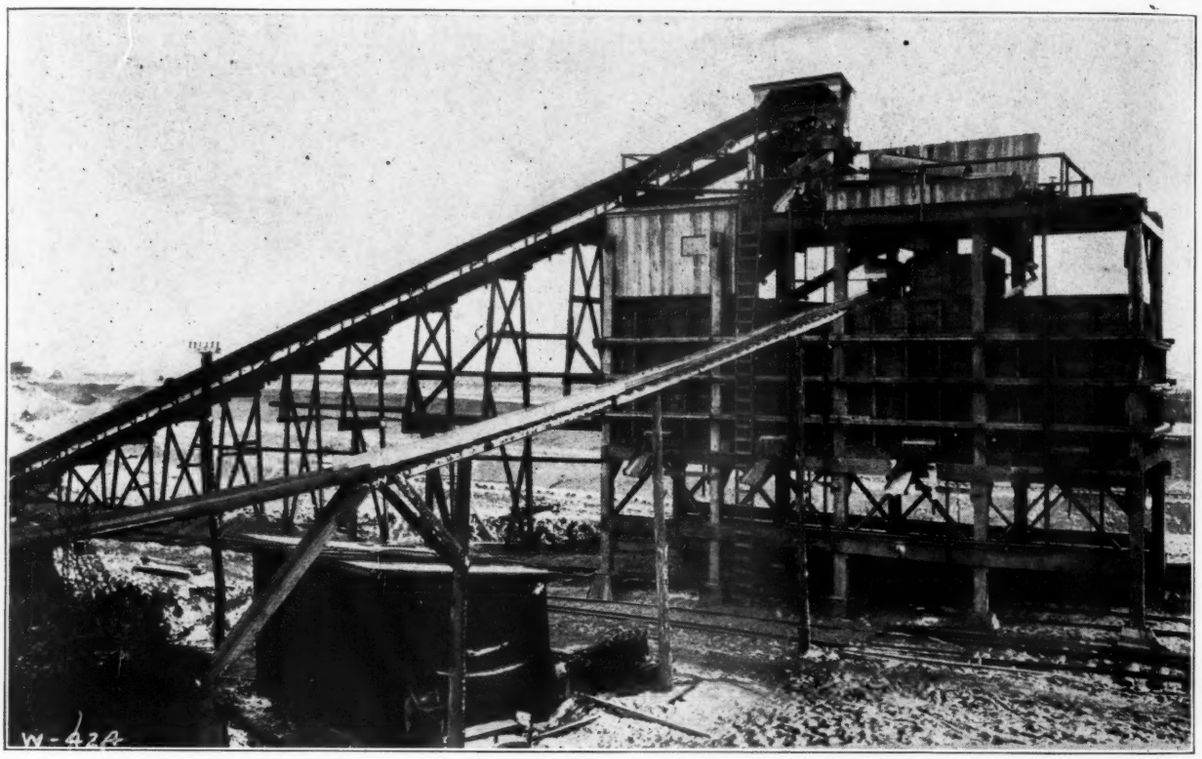
WEBSTER Sand and Gravel Plant Machinery

also Conveying and Elevating Equipment for all large operations



When you buy Webster Machinery you get two vital things:

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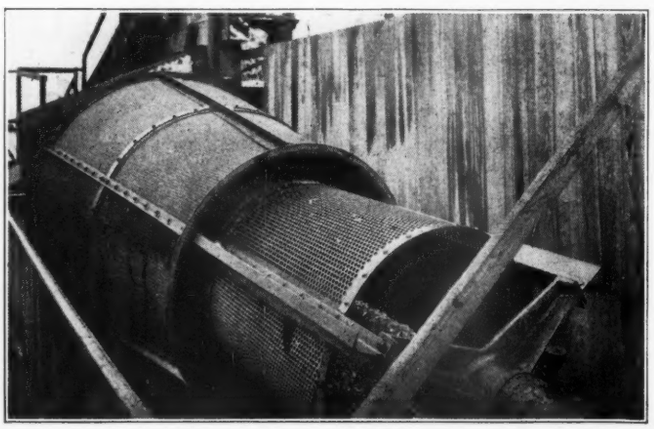
2—Dependable machinery. Webster Machinery cuts costs, saves labor and increases production.

Explain your requirements and receive the benefit of the experience of an organization that has successfully served big operators for over 40 years.

The large illustration shows a Webster Cyl-Cone Sand and Gravel Washing Plant at Ludlow, Ky., owned by Ideal Supplies Company.



The Webster Cyl-Cone Screen, shown at left, permits a particularly economical arrangement and construction for a plant to make three or more size separations

(270)

THE WEBSTER M'F'G CO., TIFFIN, OHIO, U. S. A.

New York, 90 West St. Boston, 114 Milk St. McCormick Bldg., Chicago

The advertiser wants to know that you saw his ad in ROCK PRODUCTS

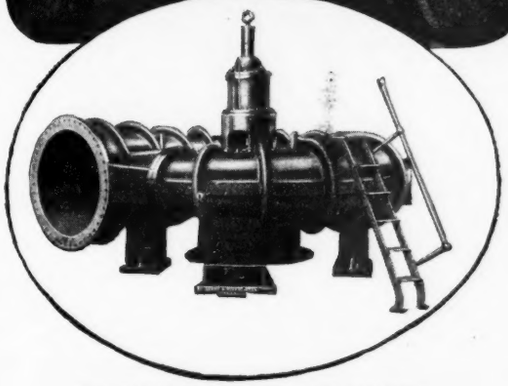
Pumps for the new dry docks —and old records were recalled

WHEN the rapid growth of the American Marine called for an immediate increase in dry-docking facilities, one of the first questions concerned the unwatering equipment.

Already Worthington pumps were used in old docks—at Norfolk, at Mare Island, at Panama—and their records invited the closest scrutiny. It was the Panama installation, indeed, which had so far exceeded the guarantee that Worthington received a five-figure bonus check.

So when new dry docks were planned, it was only natural that the Bureau of Yards and Docks again turned to Worthington—that contracts should be placed with Worthington for the pumping equipment for the new docks at Philadelphia, at Boston, and again at Norfolk.

In their application to war-time conditions alone these huge pumps are of interest, but the noteworthy fact about them, as of most Worthington win-the-war products, is that their usefulness did not end with hostilities. It is because of the peculiar necessity for Worthington products in peace-time as well as in the emergency that Worthington's eight great factories will continue to be vital factors in the world's events.



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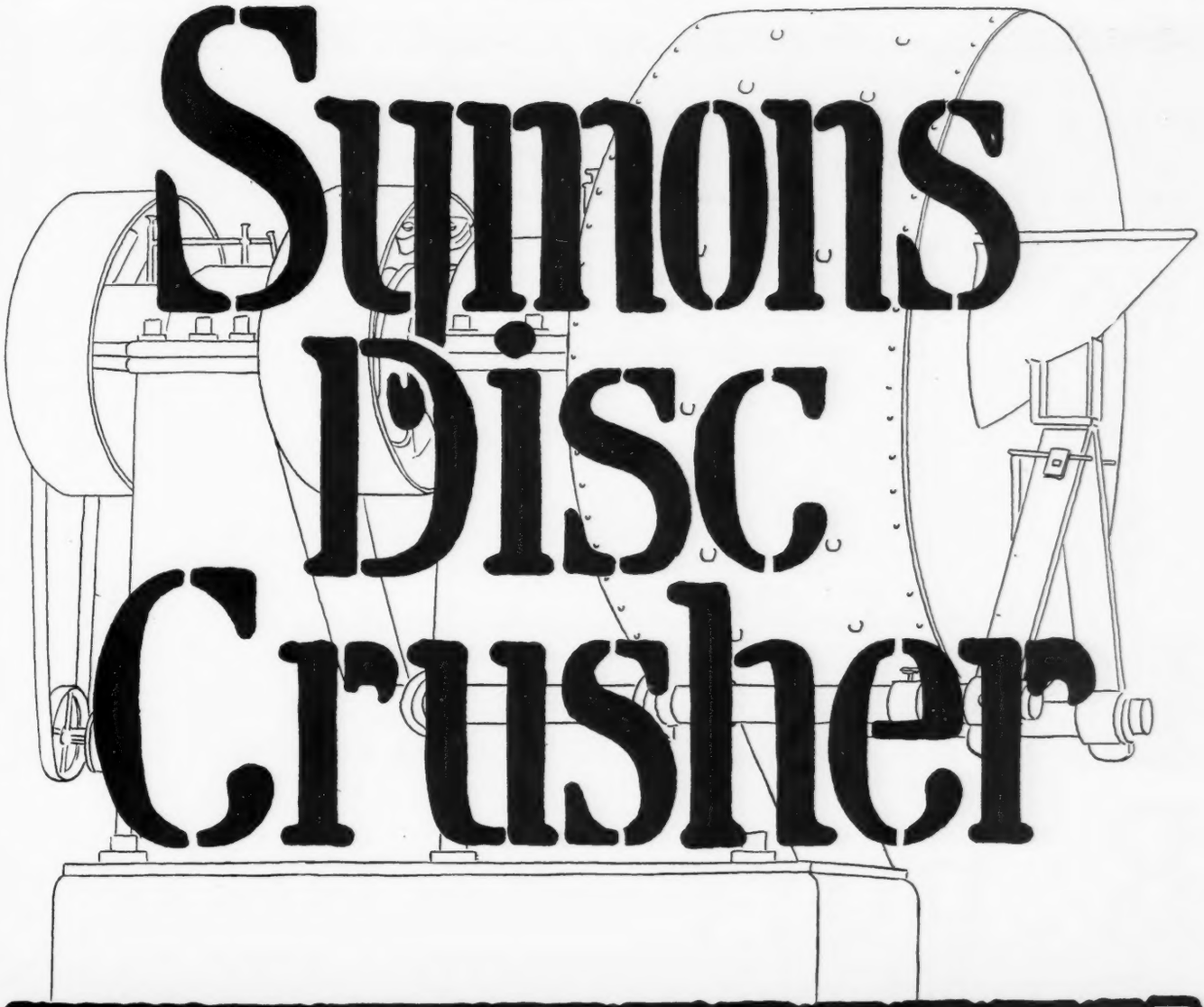
Gas Engine Works, Cudahy, Wis.

You will get entire satisfaction if you mention ROCK PRODUCTS

Symons Disc Crusher



Here are two samples of Symons performance. Names of quarries sent on request:

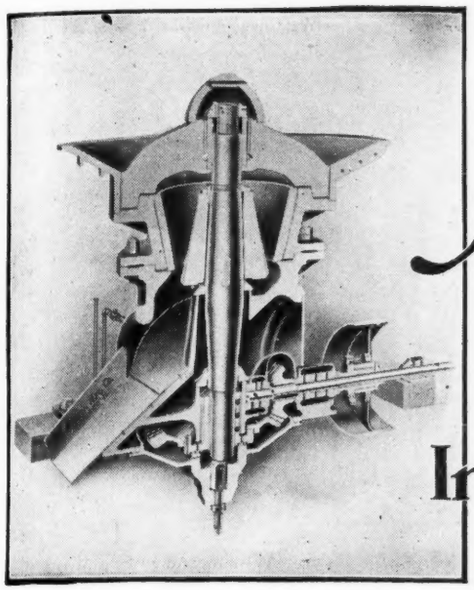
48-inch Crusher: Material crushed, limestone—Length of time operated, 3 years—Size of feed, 4 inches—Size of product, 1 1-2-in.—Horsepower used, 65—Tons per hour, 80 to 100—Tons crushed per set of discs, 750,000—Time lost on account of break-downs, NONE!

24-inch Crusher: Material crushed, gravel and hard heads—Length of time operated, 2 years Size of feed, 2-in.—Size of product, 1-2-in.—Horsepower used, 20—Tons crushed per hour, 25—Original crushing discs still in use—Time lost on account of breakage, NONE!

Why not have them do the same for you?

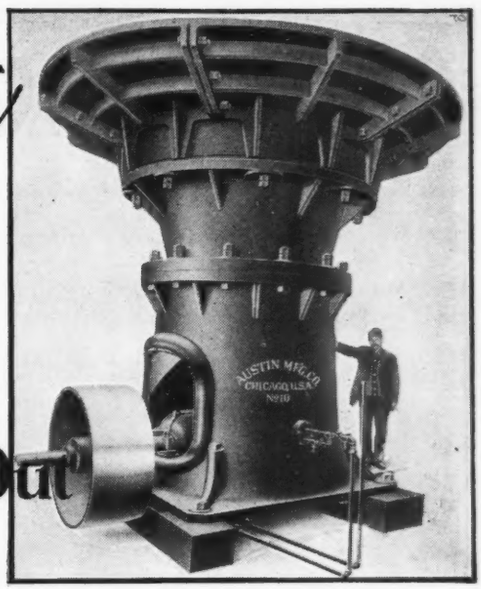
Symons Horizontal Crushers are built in 48-in., 36-in., 24-in. and 18-in. sizes and 48-in. vertical type for finer crushing

Chalmers & Williams
Chicago Heights, Illinois



Austin
Rock Crushing Equipment

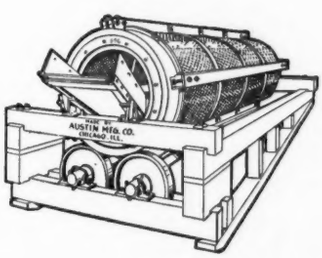
Examine *both* Inside and Out



THE more you look into the internals of the Austin Gyratory Rock Crusher, the better we are pleased. For the real mechanical superiority of any machine lies in its working parts. When a prospective user examines the details of the Austin Crusher he finds numerous practical features not found in others —features which insure greater durability and output with little wear and tear and less horse power consumed.

Austin screens, elevators, quarry cars, hoists, etc., as well as the gyratory crusher, are looked upon as "standard" by quarrymen and engineers who know what good machinery is.

Our new quarry equipment catalog, fully illustrated, and descriptive of the entire Austin line, is now available and will be sent to you upon request.



We manufacture the following machines:

Gyratory Rock Crushers
Motor Tandem Rollers
Macadam Rollers, Steam and Motor
Portable Stone Bins
Stone Elevators
Stone Screens
Elevating Graders
Road Scarifiers
Street Sprinklers
Horse Drawn Rollers
Street Sweepers, Horse and Motor
Dump Wagons
Stone Spreaders

Austin Manufacturing Company

Karpen Building, Chicago, Ill.

Branch Offices: **New York** **San Francisco**

For better service say, "I saw it in ROCK PRODUCTS"

AETNA DYNAMITE—of a particular grade that will suit your individual requirements—is so made as to represent, figuratively, when loaded, the right "tumbler" in your locked-up strata. And, Aetna Dynamites differ essentially from most brands in that they produce less fumes.

Turning to "Lion" Electric Blasting Caps, they contain a Fulminate of Mercury charge, which makes them the most dependable and efficient detonator known. We direct your attention to the .30 calibre diameter of "Lion" Electric Blasting Caps. The advantage of this diameter shell is that it gives the maximum concentration of charge, which is of vital importance. If a smaller diameter shell is used the same sized charge would be proportionately longer, and instead of a powerful blow being delivered upon a small area—such as our .30 calibre shell gives—there would be a diminished one over an extended area, with the possibility of imperfect detonation.

Then turning to Proper Loading, we find a point that is often out of true in general practice. We will mention here only one instance: We have known of blasters who have put an Electric Blasting Cap with a four-foot lead in a hole twenty feet deep and then attached light connecting wire to it because it is cheaper than the longer wires of a twenty-foot Electric Blasting Cap which are made to withstand a greater pressure. No matter how carefully a joint is made, there is more resistance to the firing current in a joint than there is in solid wire. This idea—and we have seen it used many times—is a mighty expensive attempt at economy. Proper loading, from the first stick of dynamite to the top of the tamping, and the making of proper connections, is all important.

Finishing up the combination with a "Lion" Blasting Machine, we have in it a powerful dynamo, simply constructed, yet in such a way, and of such materials, that it withstands hard usage and comes as near taking care of itself as any machine can.

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Rock Products

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CHICAGO

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Rock Products

Vol. XXII Chcago, June 21, 1919 No. 13

The Railways and the Ballast Question

Is Ballast Production a Legitimate Field of Railway Activity?

THE FERVOR of certain railway officials to economize at the spigot while Washington wastes at the bung-hole is likely to lead to considerable controversy over ballast prices. As big and steady buyers, the railways are probably entitled to lower prices than other customers of crushed stone, gravel and slag plants, but are they entitled to a less-than-cost price as they have frequently had in the past?

Statistics were gathered last winter by ROCK PRODUCTS from the maintenance-of-way engineers of all the principal railways as to the amount of ballast they would require in 1919. These figures have lost something of their value and interest through the failure of the Government to finance the railways, but some facts gathered in connection with them throw light on the railway ballast problem. The railways answering the inquiries reported the requirement of 2,000,000 tons of crushed-stone ballast, 3,000,000 tons of washed gravel ballast, 1,000,000 tons of bank gravel ballast and 660,000 tons of slag ballast.

Naturally all the slag ballast was to be purchased, nearly all the crushed stone, but only about half the washed gravel ballast and practically none of the bank gravel.

In answering the question, "Do you favor the railway company making its own ballast?", twenty-three railway maintenance-of-way men said "yes" in the case of gravel; ten said "no"; nine said "yes" in the case of crushed stone, and sixteen said "no".

This reflects to some extent the popular idea that anyone can operate a gravel plant, while a crushed-stone proposition is considered a little more difficult. There is some further excuse for this opinion in the case of gravel ballast, for most railways have cuts through gravel banks at some place on their lines and these were pretty generally utilized to put the first ballast under the tracks. Moreover, a few railways have been fairly successful in operating gravel ballast plants.

In the case of crushed stone, however, there is probably not a case on record where a railway has tried to operate its own ballast plant in competition with commercial producers without making a failure of it. The principal reasons are that quarrying and rock crushing is just as difficult a business and just as much a business specialty as operating a railway; and also if a railway produces a material up to the specifications required of a purchased material a good share of the crusher output must be wasted.

One of the best purposes the National Associations of gravel and crushed-stone men can serve is to spread such facts where they will do the most good. And in this they can be assured of the assistance of the engineers of some of the largest and best maintained railways in the country, which have tried making their own ballast and have abandoned the attempt long ago in order to buy of reputable producers, thus conserving the funds of the railway stockholders.

Railroad Administration Admits Great Deficiency in Track Maintenance

A VERY SIGNIFICANT ADMISSION was made on June 12 by C. A. Morse, assistant director of maintenance, in charge of engineering and operation, United States Railroad Administration. Mr. Morse has collected statistics showing the number of ties inserted for maintenance purposes by the roads under Federal control separately for the three years of the test period, for the ten fiscal years from 1908 to 1917, inclusive, and for the calendar years 1917 and 1918, on the basis of which he has prepared an estimated program of renewals for this year. From the summary of this information it is noted that the average renewal of ties per mile of track for all roads under federal control for the ten year period (258) varies by only 1% from that of the test period (261).

The serious handicap under which the maintenance department labored in 1917 is indicated by the fact that a renewal of only 224 ties is shown, a decrease of 14 per cent, while in 1918 this figure was only 214, or a decrease of 18 per cent from the standard of the test period. To take up this deficiency the estimated program for 1919 contemplates the replacement of 282 ties per mile, or 8 per cent above the standard established by the test period.

This certainly substantiates the charges made in ROCK PRODUCTS, of April 12, that it is high time some railway ballasting was done. The number of tie renewals is a pretty good index of the amount of attention paid to ballasting under Federal control.

How A Live Association Exemplifies the Co-operative Idea

Illinois Sand and Gravel Producers Discuss Vital Subjects—Cost Sheet and Its Value, Liability Insurance, Benefits of Group Meetings—Progress Toward Ideal

MEMBERS of the Illinois Sand & Gravel Association, in the Jefferson hotel, Peoria, Ill., June 11, exemplified the get-together-co-operative spirit at the first business meeting of the organization since the induction into office of Ben Stone as business director, March 17. There was evident always an intention to reach an understanding on matters of difference of opinion and policy, based on the idea of the good of all and injury to none. In that light the members discussed cost accounting, revision of Illinois freight rates, credit bureau, liability insurance, group meetings and the biggest test, the extension of a member's market into the field of another member.

Helpful to the Industry

The report of the business director, Ben Stone, for the first few months of his incumbency, reveals much of the work already done or started by the association and furnished enlightenment along several lines for the industry generally as well as for Illinois.

The most ticklish question that came up was the problem of conduct for a member contemplating entering a market which he had theretofore kept out of and in which other members were already established. The matter came up when it was discussed whether any member intending to ask for a freight rate to any point or points not covered in the schedule of tariffs from his producing point, should first notify the business director who could then notify all the members, especially the competitors whose field it is intended to enter.

At first several members questioned the propriety of such action. "Naturally," ran the argument, "the competitor whose field it is intended to enter will object to admitting competition and will object to an equitable freight rate. Why then notify him when we know before hand what his position will be? There will be antagonisms, of course. The justice, the usefulness and the need of such a rule are not apparent."

Prevents Useless Friction

But it developed there is good reason for such a measure, as its operation will tend to prevent useless friction among the producers affected, whereas any other way would likely produce unpleasant feelings and wastefulness.

Ben Stone, Business Director of the Illinois Association

President Schaff made this plain. He said that it was because the member whose territory is invaded would likely be displeased and antagonistic that the plan in the motion was proposed. "Isn't it better, under such circumstances," he asked, "for those concerned to have all the cards on the table in the beginning and discuss the situation in a frank manner, than to go ahead irrespective of this plan, arousing misunderstandings and animosity?"

It was clearly evident that there was no desire to limit legitimate competition, but merely to eliminate wastefulness which ultimately reacts as much to the detriment of the buyer and the public as to the producer. Of course there is no way to carry out such a scheme and no member is bound to listen to his competitor's arguments. The whole scheme is devised merely to promote better feeling and understanding by frankly laying all the cards on the table.

The Uniform Cost Statement.

The uniform cost statement (see ROCK PRODUCTS, April 12, page 22) was "adopted in principle" after considerable discussion and debate. Mr. Boynton, of the Northern Gravel Co., Muscatine, Ia., thought there was too much detail, requiring too much clerical work, especially where a concern has a cost accounting system that did not conform in detail to the association cost sheet. Another particular objection he made was that the National Association may get out a cost sheet with a different arrangement, thus piling up the work. He and others thought one style of form should be adopted for the state and the national associations.

Indiana Adopts the Form

Mr. Stone said that E. Guy Sutton had asked for the Illinois form, had commended it, and had stated that the National Association preferred to wait until the states had each adopted some form. Following this the Indiana association adopted the Illinois form. So. Mr. Boynton's objection, which was really a suggestion, was already being adopted.

Mr. Stone further explained that the cost sheet did not have to be filled out in detail; that is, the figures for the subdivisions need not be given, but the total in each main subdivision, of which there are four, should be given. The subdivision detail information is helpful when given and is of value to the members as well as to Mr. Stone in his compilation of the monthly statement. The printed details on the cost sheet also serve as reminders to all as to what constitutes costs; frequently producers overlook some items in figuring costs. In this way the sheet is educative.

Plants Differ

It was argued that the monthly statement of comparative figures does not always constitute a true basis for comparison, because plants differed. One plant neither washes nor screens its product; another does both; others have widely diverging methods of production. There should be some mark on the monthly statement indicating the character of the plant that furnishes the figures for each compiled report.

Mr. Stone admitted the contention and said he was working to overcome it. He said that he had sent a letter to each producer asking for the information necessary for him to know.

Mr. Stone's Report

In his report, Mr. Stone quoted from this letter as follows:

Information for Cost Sheet

> In this connection (uniform cost statement) I want to ask that you give name and location (billing station) each plant operated, stating distance and direction from station, if outside the switching limits. Style of plant, whether floating or stationary, steam shovel or dredge, kind of power used, and whether material is washed.
>
> Daily capacity of each plant in tons, various grades of material produced and approximate tonnage ratio of each.
>
> Name of railroad serving plant direct; also roads via which you have indirect outlet. Do you pay switching charges; if so, what rate?
>
> Number of tons each grade produced 1918, average cost and average selling price.
>
> The total number employed (monthly) 1918.
>
> Please state briefly how your activities during 1918 compared with each of the two previous years and name the markets to which the bulk of your output is shipped.

The report continues:

We asked for this information because we felt it would not only be beneficial, but necessary. It has been furnished by all but eight of the members. It is very important in connection with our work with the Highway Department.

Our uniform cost system has been heartily endorsed by those who are using it and I would respectfully urge that each member give it a trial. You can not realize its full benefit without using it. It is not necessary to change your present distribution of cost accounts in your books—the uniform statement is merely to show you the various items of cost that should be considered and accounted for.

We have established relations with the Highway Department, the main feature of which is that we are able to give our members prompt and reliable information in regard to work in prospect, bids filed, contracts awarded, etc.

Freight Rates

We will be glad to take up with the Public Utilities Commission any matters which might be of interest to members, that should be considered by that body, such as freight rates, power rates, etc.

On April 3rd and 4th, and again on May 8th and 9th, we attended hearings before the Chicago Traffic Committees of the Illinois-Indiana rate case, which involved primarily classification rates, but in which rates on sand and gravel were attacked.

Our exhibits showed the approximate average car mile haul in Illinois to be less than 50 miles and comparison of Illinois rates with Indiana rates showed general level in Illinois a trifle higher than in Indiana.

Our chief contention was that rates on sand and gravel should be made with regard for the particular conditions affecting production and marketing, and without respect to any classification.

Fortunately this case has been taken from the committees and referred to the Interstate Commerce Commission, where it should have gone in the first place.

Demurrage

The matter of demurrage as it affects the sand and gravel industry is now being handled with the Demurrage Committee of the National Industrial Traffic League. This committee has already agreed with the American Railway Association upon a general revision of the present demurrage rules, in which was incorporated average agreement on outbound loads, and which would bring material relief to the sand and gravel producers; but so far the proposed new rules have not been accepted by the Director General.

We have also handled a few rate and transportation matters for certain groups and some individual members. We will be glad to render any assistance we can in this field.

Readjustment of Illinois Freight Rates

We have been informed by C. W. Galligan that a comprehensive study of rates in Illinois was being made by a committee, of which he is chairman, the purpose being to eventually bring about a general readjustment over the state, so that there would be a definite relationship established.

Mr. Galligan thinks now, however, it will not be possible to bring this about this year, and I would suggest that any members having rate problems endeavor to have them worked out individually.

Absorption of switching is one feature that should be carefully gone into by everyone who has such a burden. Formerly there was more or less justification for non-absorption of connecting-line switch charge by the road-haul carrier on account of very low rates in many instances, but at present rates are generally compensatory and it is our opinion switching charges should be absorbed.

Those who endeavor to maintain a file of freight tariffs for their own information, are advised that most of the Illinois lines are re-issuing sand and gravel tariffs, and the new rates should be checked carefully as received.

Construction News Bulletin

In addition to the weekly bulletin, we have just arranged to send out each Monday a special bulletin, giving news of prospective construction work and contracts awarded over the state during the preceding week.

We have asked the Department of Labor, United States Employment Service, to refer to us any returning soldiers, sailors or marines seeking employment as steam shovel operators, pump men, drag line operators, etc. In order to make this effective we should know the wages paid, hours worked, and other details in connection with any vacancies that members may want us to help fill.

Liability Insurance

We have investigated the matter of liability insurance, it having been suggested that by placing same collectively a lower rate might be obtained. Our information is that rates are made with respect to conditions at the individual plant and would not be affected by collective purchasing.

Group Meetings Beneficial

In April we had a group meeting at Springfield of producers interested in that territory, and a few days later those interested in the territory south of Centralia were entertained by Mr. Halliday at Cairo. Matters of mutual interest affecting the general welfare were discussed.

I believe it would be highly beneficial if we could have these group meetings of members interested in certain sections of the state as an established custom and as often as once each month during the producing season.

I have been deeply impressed with the uniform harmony which prevails throughout the Association and earnest endeavor being made by each member to live to up the fine purpose expressed in the Constitution and By-Laws: "It should be the purpose of this Association to establish cordial personal relationships among its members."

Members Recognize the Principle

It means to me that the members of this Association have a full realization and appreciation of the fundamental principle of true co-operation. Such a purpose is the very life of organization, for it is unalterably true that no association can live and prosper which does not have an ideal higher than mere financial benefit.

I cannot think of a better way to maintain, develop and possibly improve the existing relationships than through the channel of frequent group or district meetings. The nature of the commodities produced confines distribution to certain territories and on that account alone I am convinced our organization could be made most effective by having the producers interested in specific territories get together at regular intervals.

Lack of Uniformity

In the short time I have been in the work I have found considerable lack of uniformity, not only as regards the state, but with respect to conditions existing in specific markets and territories. For instance, one producer allows a discount for prompt payment; another doing business in the same market makes no provision for discounts; one producer incorporates certain specific terms in his contracts, while another may have different terms; one may refrain from quoting other than bona fide dealers on contractors on large jobs, while another may quote anyone who wants a car of material; one may have labor problems that the others know nothing about, and so on through a long list of matters that might be considered in group meetings with benefit to those directly interested and to the industry at large.

A great many conditions affecting the welfare of this industry have been changed by the war and must be considered in their new light. The best way to do this is to have a free exchange of ideas.

Relationship Must Be Studied

Some of the most important matters which must be considered by all successful associations are relations of members with one another, relations of employers with employes, relations with customers, relations with those from whom you buy, relations with the public generally.

Some of you have no doubt worked out all of these things in a highly satisfactory manner to yourself; there may be others who are now struggling with one or more such problems, and a suggestion would be of great benefit.

Sand and Gravel Concern With Widely Separated Operating Units

Dredged River Material Transported Seventeen Miles Down Illinois River to Crushing, Washing and Screening Plant at Peoria—Unique Method of Grading

ACROSS FROM PEORIA'S BUSINESS section on the Illinois River is the washing and screening plant of the Peoria Washed Sand & Gravel Co. Seventeen miles up the broad Illinois near the city of Chillicothe are the digging and raising operations of the company. Between the source of supply and the refining plant, the company operates a steam tow-boat, "Sanco" and a fleet of 13 barges, two of which carry the coal supply for the dredge.

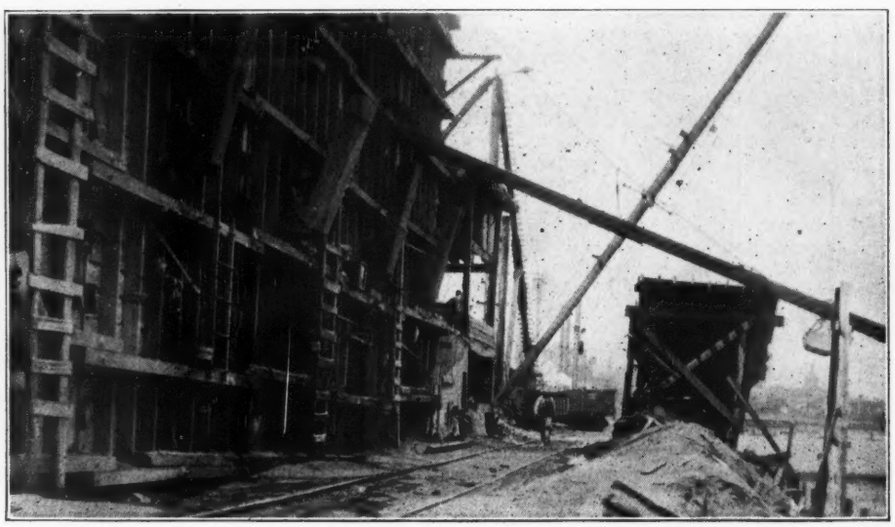
These are widely separated units, yet the 17 miles do not interfere with the steady operation of the plant. The dredge digs an adequate quantity and the "Sanco" hauls three or four barge loads in its daily trip to the plant, providing an excess of material at times, an insurance against a shut down that might otherwise be caused by a temporary delay on either the dredge or the barge line.

The dredge with its 1½-cu. yd. clam shell fills three or four barges every day, depending on the sizes of the barges, the capacity of which vary from 150 to 300 tons. The dredge keeps employed an engineer, a fireman and a deck hand. The tow boat has a crew of six: pilot, engineer, fireman, cook and two deck hands. It makes one round trip every 24 hours.

The barges are unloaded alongside the plant in a slip of the river by a stiff legged derrick with a clam-shell bucket of 1½ cu. yd. capacity, suspended from a boom 73 ft. long. This boom has a wide swing and the clam shell may deposit its burden in a hopper, on a grizzly on top of the grizzly house or onto a reserve stock pile.

Tow boat "Sanco" which makes daily trips for cargoes

The receiving hopper



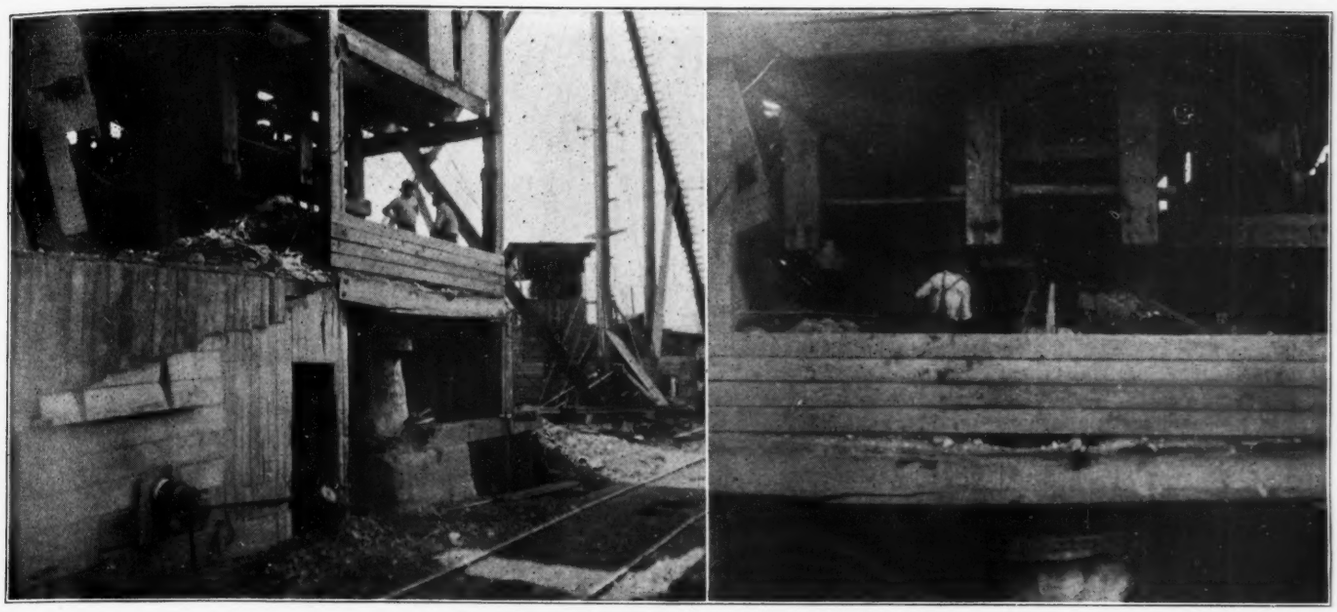
Loading bins in left foreground; in center, opposite receiving hopper, the grizzly house; in background, the derrick

The hopper which stands on the bank of the slip feeds a drag belt (30 in. wide; 30 ft. center) that passes under the loading tracks to the grizzly house. Here an elevator with V-shaped buckets, 24 in. long and 12 in. deep, elevates the material to the grizzly. The material dropping through the grizzly enters a roller screen designed by John M. Atterbury, the plant foreman. It is 4 ft. in diameter; 12 ft. long; perforations 1½ in. Rejections are chuted to a No. 5 gyratory crusher below, while the passed material is chuted to a "V" bucket elevator. The crushed material is also taken up by the same bucket elevator to the top of the washing and grading plant. These buckets are 18 in. long; 9 in. deep.

The buckets discharge into an inclined cylindrical scrubber into which a 1½ in. stream of water is directed. Vanes attached lengthwise to the inside of the cylinder wall raise and drop the material into the stream as the scrubber revolves.

Screening Operations

From the scrubber the material is washed into the conical screens of which there are three, all revolving on the same shaft as the scrubber. Washing continues in each screen, the water entering through a pipe at the lower end of the screen. Under each screen is an inclined pan, set parallel to the screen, which collects the passed material and sends it into the next screen, if so desired. In the lower end of the pan, just

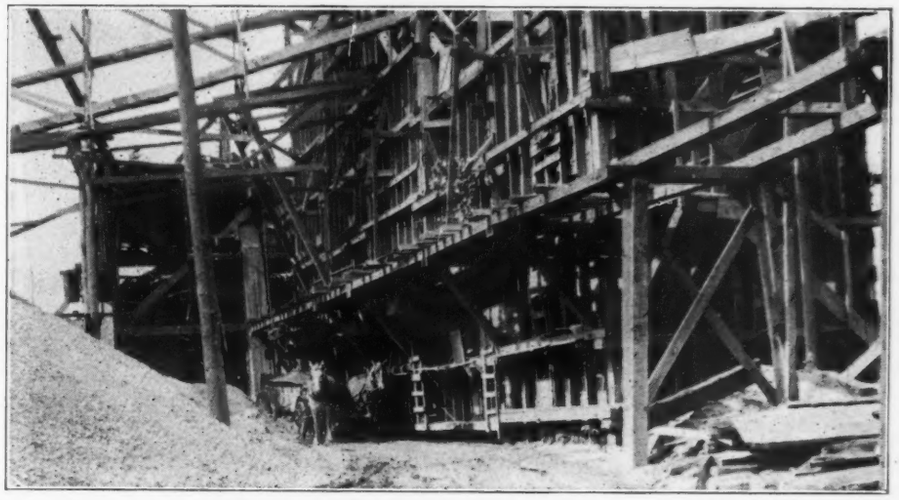


1—Grizzy house; opening between rails indicates place where drag belt conveys from receiving hopper to bucket elevator.
2—Second story of grizzly house; at right in dark outline is bucket elevator carrying material to grizzly on top

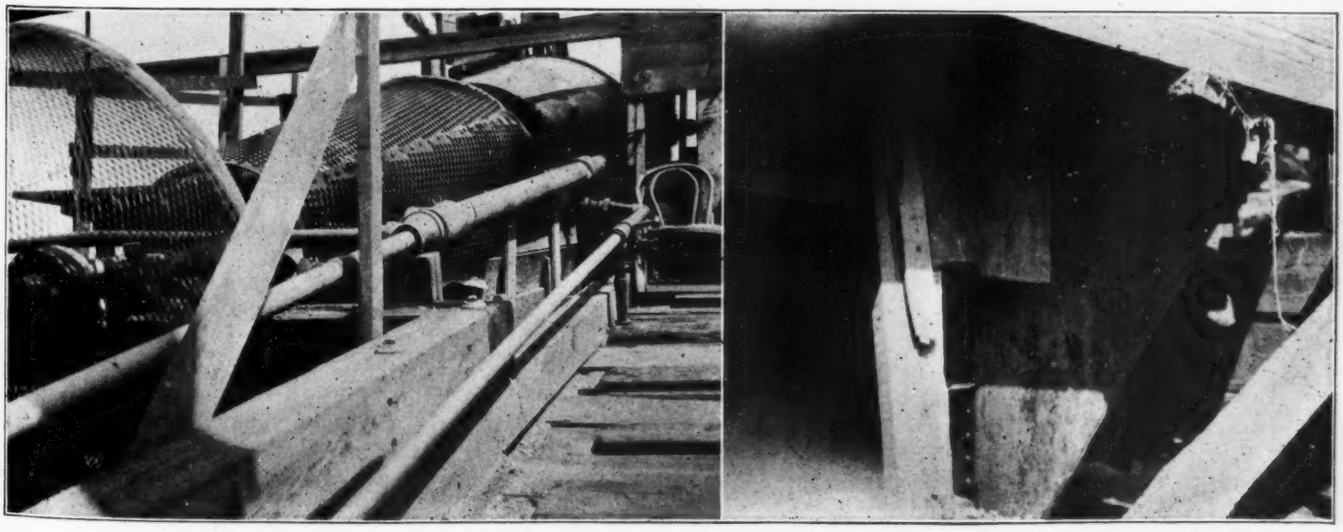
below the discharge end of the screen is a hole. By an arrangement of baffle boards and a door for the hole, material from both the screen and the pan is prevented from entering the bin below. In such case the material continues on its way into the next screen.

On the occasion of the visit of a ROCK PRODUCTS representative, the screens used were perforated in this order: 1½ in., ¾ in., and ¼ in. Both the rejected and passed material from the 1½ in. screen was delivered to the next screen, (¾ in.). The rejections from this screen were dropped into the bin below, while the passed material collected on the pan went into the third screen. The passed material, (¼ in. sand) flowed into the settling tank while the rejections fell into a bin.

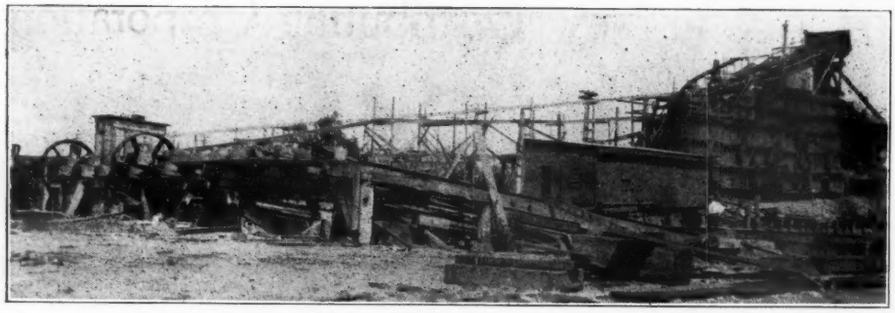
The pan installation is an idea of Mr.



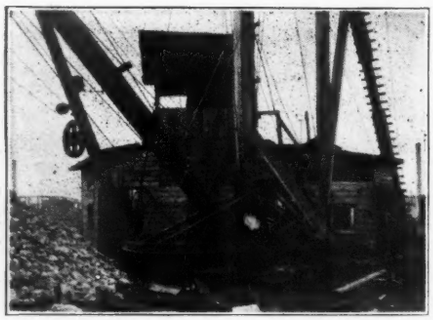
Where wagons are supplied; railroad track on other side of structure; storage pile at left for washed and graded material



Screens and scrubber in background; a glimpse of a bucket coming over the top may be seen at top; one of the settling tanks in right hand picture



GENERAL view of plant is here shown in picture at left; in the foreground, repairing a barge drawn out of the slip by the company's own boat yard equipment; the boat had several holes in bottom; small structure, the machine shop; beyond, the plant.



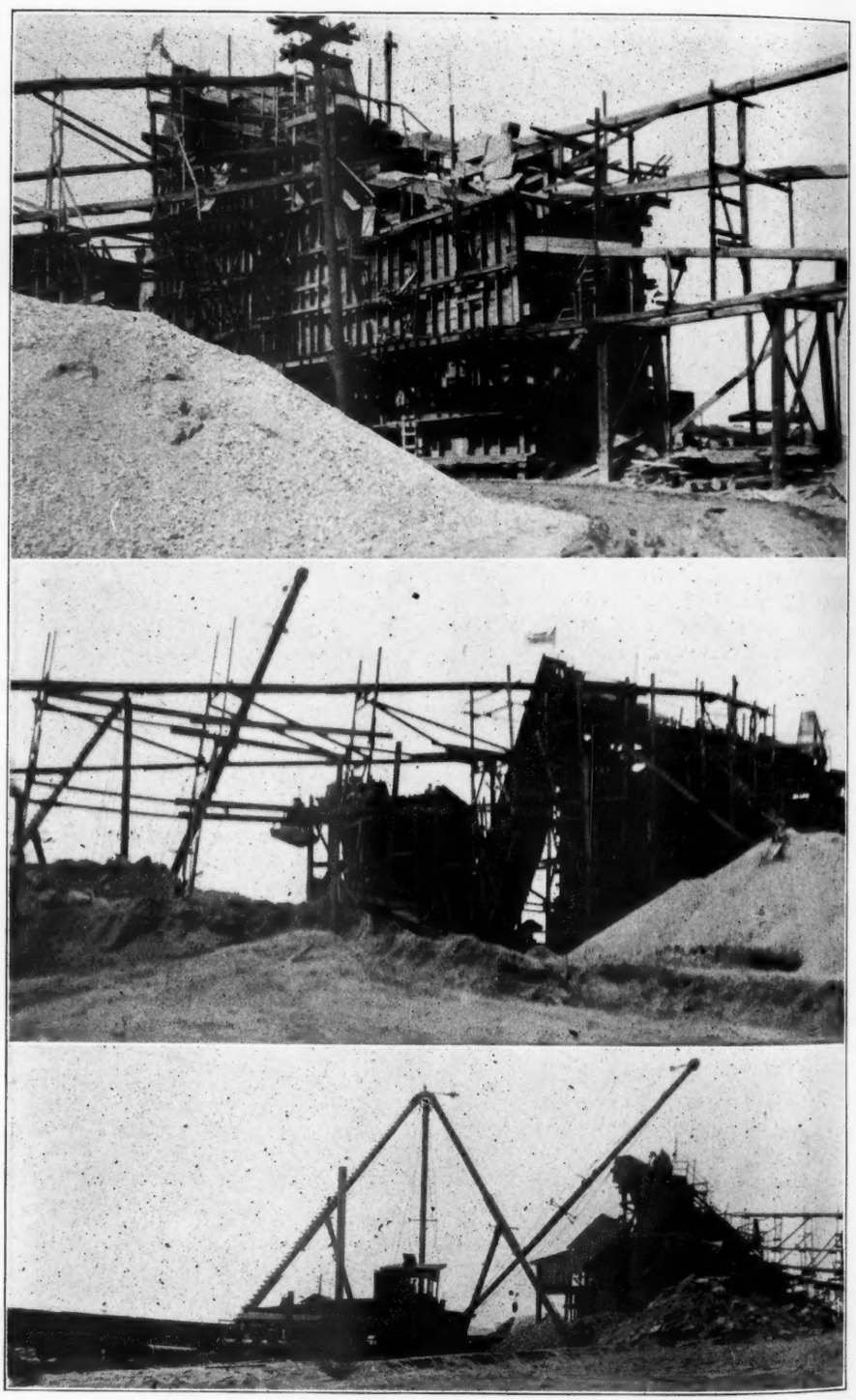
The stiff legged derrick

Atterbury's, who has done much in improving facilities around the plant. The pans apparently add to the flexibility of production, making it easier to produce any desired mixture wanted by a right combination of screens. Extra screens are kept on hand for different sizes.

Leading from the plant are a number of chutes. These take produced sizes direct from the screen or pan to the several ground storage piles, when bins are full or the particular size is not wanted for loading.

Electricity is largely employed and several motors are in use. The main motor (75 h. p.) pumps water for the washery, runs the crusher and the roller screen. A 35 h. p. motor runs the drag belt and the first bucket elevator. A 25 h. p. motor operates the scrubber, screens, and the buckets that lift material to the top. The revolving derrick is operated by steam power. Water for the scrubber and screens is pumped from the river through a 5 in. intake.

Two men, engineer and fireman, are employed on the derrick: during unloading of the barges, two extra men are employed on the barge being unloaded. Two men are kept busy in the grizzly house; one man takes care of the screens and scrubber; two men load cars; one loads wagons. The capacity of the plant is 12 cars a day. A machine shop is a feature of the plant, equipped with necessary machinery for ordinary repairs. The plant is built on made land, a filled in portion of the river. In this manner the slip, a sort of harbor for the tow boat and barges was built. Provision for drawing damaged barges out of the water up an incline is a feature of the slip. D. S. Brown, one of the first members and a booster for the Illinois association, is president of the company.



Views from different points: Upper picture shows wagon loading side and storage pile; center, boom of derrick, the grizzly house, the inclined elevator shaft, the washery; lower picture, the power station of derrick

Buffalo Gravel Men Active in New Distributing Corporation

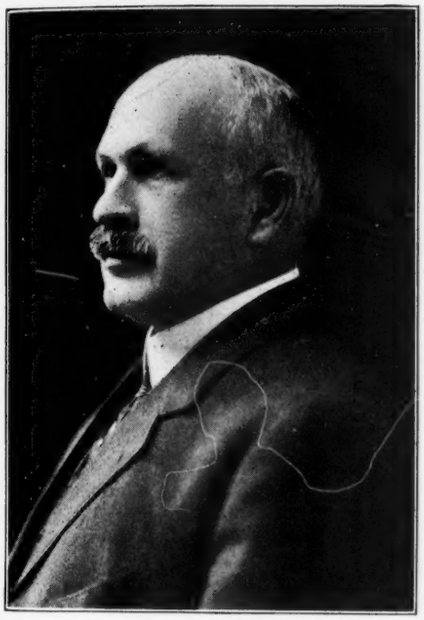
BELOW ARE PORTRAITS of three of the active organizers and leaders of the Buffalo Gravel Corporation, the formation of which was described in ROCK PRODUCTS of June 7. This new corporation will handle the entire output of four of the principal sand and gravel producers operating in the Niagara River.

Both Messrs. Hyman and Carroll have other sand and gravel properties, which are not included in the new corporation. Mr. Hyman owns pits in Ontario, Canada, and Mr. Carroll in Attica, near Batavia, New York.

Mr. Carroll is already well known to all readers of ROCK PRODUCTS as one of the directors of the National Association of Sand and Gravel Prolucers, and as one who has given freely of his time and money for the good of the sand and gravel industry of this country.

Mr. Hyman is also a crushed stone producer. He is a member and director of the Provincial Stone and Supply Co., Toronto, Ont. Until recently he also operated limestone quarries at Pekin, N. Y., for the production of blast-furnace flux and agricultural limestone.

The formation of the Buffalo Gravel Corporation gives the city of Buffalo a service in sand and gravel deliveries which few other cities enjoy. All four of the producing companies have operated large fleets of motor trucks as well as having contracted for deliveries by motor-trucking companies. All this work is now co-ordinated under Mr. Eberley, whose right-hand assistant is a son of Mr. Carroll.



D. Hyman, President

Is president of the Empire Limestone Co.; director of the Provincial Stone & Supply Co., Toronto, Ont.

J. E. Carroll, Secretary

Reuben W. Eberley, Manager

Has been operating head of the Perry-Victoria Sand Co. for a number of years.

Central West Highway Engineers Allow Use of Screenings

AT A CONFERENCE on recommended practice for rural concrete road construction, held in Chicago last February by the Mississippi Valley Association of State Highway Departments, the following specifications for aggregates were adopted:

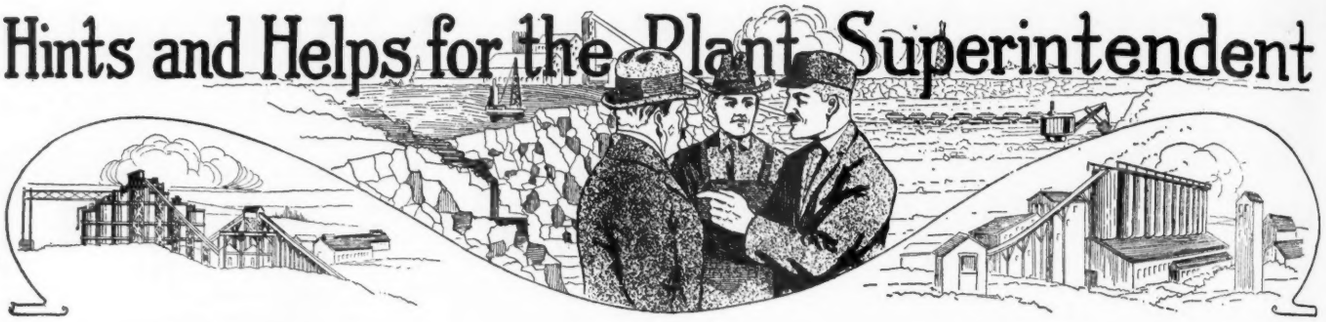
"**Fine aggregate** — Fine aggregate should consist of particles of durable rock that will pass a laboratory screen having four meshes per inch. The fine aggregate may consist of natural sand or of a mixture of natural sand and screenings from durable crushed stone or gravel, provided the screenings are free from dust and the volume of screenings does not exceed 50 per cent of the volume of fine aggregate. It is important that all fine aggregates be tested for organic impurities.

"**Coarse aggregate**—The coarse aggregate for one-course pavements and for the base course of two-course pavements should be composed of pebbles or crushed stone. All of the particles should be sound and durable. Slag of suitable quality and uniformity may be employed. The crushed stone should be durable and of uniform quality and should have a French co-efficient of wear of not less than seven.

The aggregate should be free from flat and elongated particles. The sizes of the particles should be graded reasonably uniformly from coarse to fine, such that all will pass a 2½-in. screen, and not less than 95 per cent retained on a ¼-in. screen.

The coarse aggregate for the wearing course of a two-course pavement should meet the above requirements except that the maximum size should not exceed that which will pass a 1-in. screen."

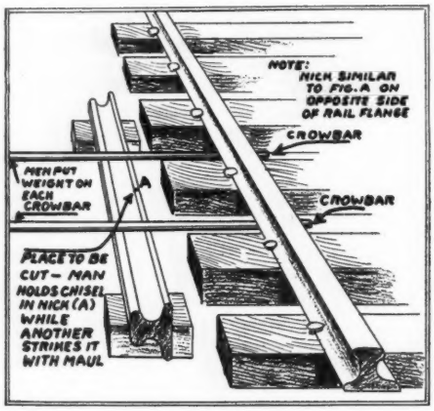
Hints and Helps for the Plant Superintendent



Quick and Safe Method of Cutting Rail in Half

THE SIMPLE METHOD devised by John F. Roche, superintendent of the Hammond, Ill., pit of the Chicago Gravel Co., for cutting a rail is both a time and labor saver; it also does away with the danger attached to the old way of dropping the rail on the ground to break it after a man has spent half a day in sawing.

First the rail is cut half an inch deep



How to cut a rail without a rail saw

on both (opposite) sides of the bottom flange or base. Then it is laid on its side, each end resting on a block of wood. Two crowbars are laid across the rail on each side of the nick, far apart enough to permit a man to work between the bars. The points of the bars are placed in a fixed position, while on the other end the men place their weight, thus bearing down on the rail to be cut. As their weight is applied, a man between the bars holds a chisel to the nick and another brings down a maul or sledge upon the chisel. Three or four blows is generally sufficient to divide the rail into two parts. This is done in three minutes.

This method requires only four men for a very brief period. It compares very favorably with the old method of sawing for hours until the rail is nearly sawed through after which a half dozen men must lift and drop it three or four times to complete the separation. Men frequently are hurt trying to break a rail in the old way.

Screening Efficiency

ACTUAL TESTS of the efficiency of cylindrical screens in crushed stone and sand and gravel plants are seldom made, although it is certain it would pay to make them, and to revise the size, speed or slope of the screens to give results of a maximum efficiency. No general rules for these factors can be made to apply to different materials. No two gravel or crushed stone mixtures are identically the same, nor are the desired products of the screen always the same.

In screening wet materials like sand and gravel the amount of water used is an important factor in screening efficiency. Screen inefficiency is often caused by too heavy a feed on a screen with insufficient slope. This is particularly true of the smaller sized material when not enough water is used.

The efficiency of a screen may be figured from the following formula:

$$\text{Efficiency} = \frac{\text{Wt. of undersize passing screen}}{\text{Total Wt. of undersize in feed}}$$

A sample of the screen feed is taken and tested in small shaker sieves made for that purpose. The facts in regard to the size, slope and speed of the screen are then recorded and the test conducted long enough to insure average results. It is necessary, of course, to catch and measure the material as it comes from the screen. The record would then be, for example:

	Sieve Test.	Screen Test.
Oversize	17.2%	44.7%
Undersize	82.8%	55.3%

The relative weight of undersize passing the screen is $\frac{17.2 \times 55.3}{44.7} = 21.28$

and the efficiency $= \frac{(82.8 - 21.28)\ 100}{82.8} = 74.06$ per cent

In other words, the screen is removing only three-fourths of the fine material it is supposed to remove.

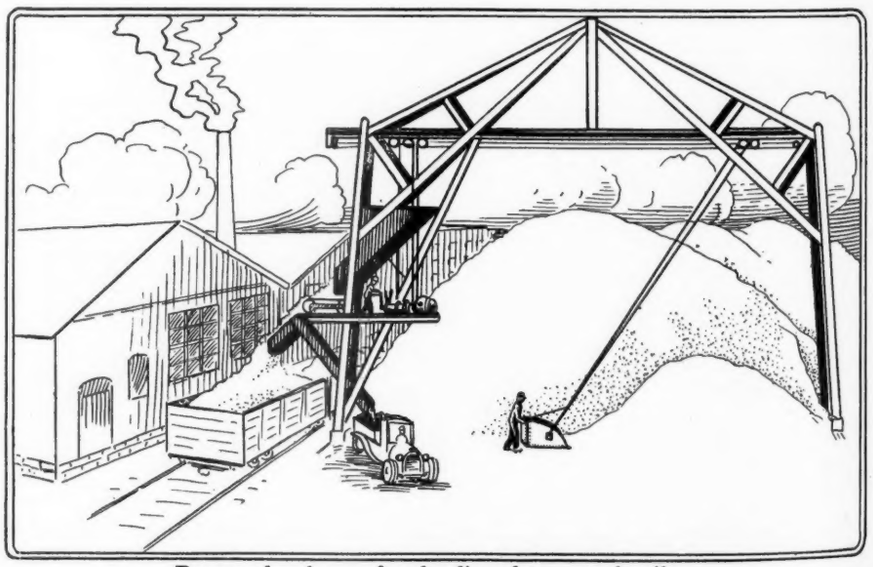
A series of such tests as these would establish the best speed, slope and amount of water to use.

Loading from Stock Piles

THE ACCOMPANYING SKETCH shows a device proposed by a bucket manufacturer for loading crushed stone sand or gravel from stock piles adjoining railway tracks and parallel to them.

The bucket and its operating hoist is carried on a traveler which straddles a stock pile.

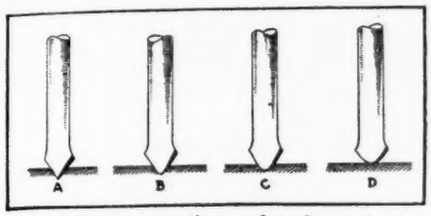
The traveler may be moved on rails by car pushers, or may have a chain or belt driving mechanism from the hoisting engine, or in the case of electric power, a separate motor could be used.



Proposed scheme for loading from stock piles

Avoid Dull Drills

THE BIT IS LEAST EFFECTIVE, has the least penetrative results, blow for blow, when it strikes the rock the hardest and feels the shock the most. It is the sharp bit that does the work; the dull bit is the inefficient victim of



Relative penetrations of a sharp drill and dull ones

mistaken or neglectful practice. Drills must wear, but the limit of permitted wear should be sharply defined, and the systematic maintenance of sharp bits should be recognized as the most profitable investment possible in connection with rock-cutting operations. Especially is the power-drill sharpener to be commended, not only for its incomparably greater efficiency, as compared with hand sharpening, but also for its promotion and maintenance of the sharp-drill habit of thought and practice.—Frank Richards, in the "Engineering and Mining Journal."

Breaking Up Concrete

THE CUSTOMARY METHOD of removing old concrete inside of buildings is by drilling holes with jumper steel and sledges by hand and then breaking off the material bit by bit with wedges. This is a very slow and expensive way to handle work of this kind. The best, quickest and cheapest method to remove old concrete, brick or masonry, is by blasting with explosives. At first thought, most people would immediately say that explosives could not be used, as they would crack the walls of the building above or damage nearby machinery and be altogether too dangerous. As a matter of fact, explosives can be used with great economy of time and money in almost all cases and with absolute safety. As a general rule, concrete is very easily broken by blasting, and experience has shown that the better the concrete, the more easily it can be broken.

In doing this class of work care must be exercised to see that the holes are properly located—which, however, is true of all blasting—and that light charges of explosives are used. Care and a nice sense of judgment must be exercised.

An explosive of relatively slow heaving action, like ammonia 30% to 40% strength, is best adapted for such work rather than a very quick and shattering explosive.

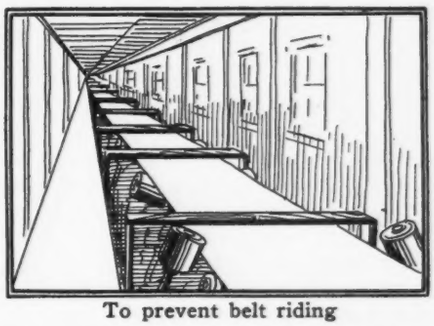
Question Box

GOT a problem you want help on? Send it in. We will agree to find some operating man who can answer it.

The drilling of holes is best accomplished by the use of self-rotating hammer drills, but when the size of the work does not warrant such equipment, holes can be drilled by hand, using jumper steel or hand drills and sledge. It is best to demolish the structure by gradual steps or benches, or a little at a time, especially if located inside or under a building. Holes are drilled, as a rule, from one inch to one and one-half inches in diameter, and in depth depending on the thickess of the material, although six-foot holes are about as deep as should be shot in close quarters.

Prevent Belt Riding

A NOT UNCOMMON SOURCE of accident in sand, gravel and crushed-stone plants is the riding of belt conveyors by employes. Probably this riding is done both to save steps and as a "stunt."



To prevent belt riding

In either case belt riding should certainly be discouraged in the interests of safety-first. Warning signs may do some good, but a more effective method is that shown in the accompanying sketch. The bars need not be more than 2½ ft. high.

HOW SAFETY WORK PAYS

The following figures show the results obtained at two cement plants where safety has been promoted, not only by installing guards, but also by enlisting the cooperation of the workmen:

	PLANT A			PLANT B	
	1916	1917	1918	1917	1918
Hours Worked	1,868,604	1,970,923	1,476,116	896,746	662,597
Accidents:					
Less than 15 days lost	152	131	107	17	14
Over 14 days lost	24	27	14	14	7
Permanent Injuries	3	2	2	2	0
Fatalities	3	0	0	0	0
Totals	182	160	123	33	21
Cost of Accidents:					
Medical Expenses	$ 834.10	$ 730.70	$ 731.25	$1,119.52	$ 242.00
Temporary Disabilities	680.60	2,810.00	404.73	651.14	337.85
Permanent Injuries	1,058.04	1,250.00	3,000.00	3,034.39	0.00
Fatalities	10,748.19	0.00	0.00	0.00	0.00
Totals	13,320.93	4,790.70	4,135.98	4,805.05	579.85
Compensation Premiums	19,698.00	35,105.33	31,881.29	17,212.53	14,893.96
Loss Ratio	67%	14%	13%	28%	4%

The company's executive in charge of manufacturing at these plants writes:

"As you know, we have spent considerable time and money in safeguarding our plant and creating a spirit of carefulness among our employes. The results obtained in reduction of serious accidents and lost time have netted us large returns in addition to the actual money saved by reason of carrying our own workmen's compensation insurance."

Prospects of the Glass Sand Industry Never Were Better

R. B. Ladoo, of U. S. Bureau of Mines, Summarizes Situation at Home and Abroad

GREAT BRITAIN HAS REMOVED IMPORT RESTRICTIONS on the importation of glass-making machinery, optical glass and manufactures thereof, miners' lamp glasses, and miners' electric lamps, and no individual licenses are now needed. Glassware (including bottles and jars) other than scientific glass and glassware, machinery glass and glassware, optical glass and manufactures thereof, miners' lamp glasses, and miners' electric lamps are to be admitted at the rate of 50 per cent of 1913 imports.

A shortage of glass of all kinds is evident in nearly all European countries. England reports a scarcity of bottles, lantern globes, and cheap tumblers; France and Belgium need all kinds of glassware, particularly plate and window glass; glass in Italy is scarce and high priced. In the invaded territory of Italy most of the window glass was destroyed or removed by the retreating armies. In England the shortage is being made up by imports under special licenses and by expansion of the existing facilities for manufacture.

Long Time Before Belgium Will Export

The window glass factories of Belgium are practically undamaged and the plate-glass factories, with the exception of that at Courcelles, which was American owner, have not suffered greatly. The supply of labor seems adequate, but wage disputes and railroad conditions have greatly delayed the starting of the factories. Prices of window glass are great and in addition France is looking to Belgium for part of her needs.

As soon as labor disputes are settled and the railroads are able to handle raw materials, the glass factories should enjoy a long period of great activity. However, owing to high labor costs, shortage of coal, and high freights, Belgium will not be able to resume her export trade for the present at least. It is doubtful if she ever will entirely regain the large export trade she had before the war, owing to the expansion of the glass industry in other countries, notably Japan and Canada.

French Glass Works All Destroyed

In France, glass factories in the war zone were completely destroyed, and the damage done to the coal mines will make fuel scarce and expensive for some time. Her reconstruction needs for glass are great and much of this material must be imported. Already several large orders have been placed in the United States, of which some have been completed and shipped. Shipments of watch crystals from Alsace-Lorraine have been started again and it is expected they will regain their former position in the world trade, replacing those of Japanese manufacture used during the war.

Glass Industry in Italy

There is only one factory in Italy capable of producing window glass on a large scale—that of the St. Govain firm near Pisa—and its operation has been greatly impeded by a flood of the River Arno.

Factories in Murano ceased to operate and were transferred to Livorno during the Austrian invasion.

It is stated that the damage sustained during the invasion of the Veneto (Venetian plain) in 1917 in four reporting factories totaled 2,171,950 lire (6.35 lire=$1) divided as follows: Plants exclusive of machinery, 261,550 lire ;raw materials, 68,000 lire; other damages, 402,900 lire; loss through inactivity, 1,055,000 lire. The scarcity and high cost of fuel and other raw materials have made the resumption of glass manufacture difficult. Moreover, import restrictions have kept out foreign glass. Italy will not be able to supply her own needs, and as soon as imports are permitted, American glass should find a ready market in Italy.

The domestic plate and window glass business is in good condition. Plenty of orders are on hand and the long-expected boom seems about to be realized. In response to the general tendency toward price reduction and stabilization the prices of plate glass have been reduced 5 to 6 per cent.

The Pennsylvania Glass Sand Co., of Lewistown, Pa., is planning the development of several new deposits of glass sand, among which are several deposits along the line between Tennessee and North Carolina and a large deposit near Huntingdon, Pa., on the main line of the Pennsylvania Railroad. This company now operates a number of glass sand mines and quarries in Pennsylvania, West Virginia and New Jersey.

Prohibition Prospect Scares Bottle Makers

Bottle manufacturers are much concerned over the effect of prohibition upon the market for bottles. It is stated that between 4,000,000 and 5,000,000 gross of bottles for beer and other beverages, whose manufacture will be cut off by prohibition, have been manufactured yearly in this country. At least one large bottle works has already closed its plant for this reason and the National Bottle Manufacturers' Association has adopted a resolution urging that the Government lift the ban on light wines and beer.

Gypsum Imports From Canada Increasing

By R. B. Ladoo, U. S. Bureau of Mines

GYPSUM IMPORTS from Canada are gradually increasing. In April, 1919, 6,326 tons of crude gypsum came from this source with a total value of $9,297. During the same month, 809 tons of ground or calcined gypsum, valued at $11,482, was imported from Canada. The average monthly imports of crude gypsum for 1916 were nearly 20,000 tons per month.

The gypsum production of Canada gradually declined during the war until in 1918 the total tonnage mined was less than a quarter of that in 1913. The 1918 production is shown in table below.

The average number of men employed in 1918 was 435, with the aggregate wages of $273,728, or about $630 per year. In 1917, 774 men received $445,128 or about $575 per year.

Practically all of the gypsum imported into the United States comes from Canada, but the proportionate value of imports compared to domestic production is small and is decreasing. In 1917 the value of imported gypsum was only 3.6 per cent of the value of domestic production. These imports are important, however, as the New Brunswick and Nova Scotia gypsum is of a high grade and adapted to certain special uses.

CANADIAN GYPSUM PRODUCTION IN 1918

Grade	Tons	Value
Lump gypsum	43,728	$ 47,727
Crushed	25,074	55,079
Fine ground	4,558	12,621
Calcined	78,927	707,579
	152,287	$823,006

Province	Tons	Value
Nova Scotia	49,365	$115,976
New Brunswick	27,225	214,114
Ontario	38,214	151,564
Manitoba	37,483	341,352
	152,287	$823,006

On Your Guard Mineral Aggregate Producers

Safety-First Precautions Give You An Intimate Interest in the Settlement of the Railroad Scramble

IN HIS MESSAGE TO CONGRESS President Wilson announces that the railroads will be handed back to their owners at the end of the calendar year. Previous to that time he had recommended that suitable legislation be passed respecting their future operation and control. There have been submitted to Congress by various interests and individuals a number of legislative plans, chief among which are the following:

Recommendation of: (1) Director General Walker D. Hines; (2) The Interstate Commerce Commission; (3) The State Railway Commissioners; (4) The Railway Executives; (5) Owners of Railroad Securities; (6) Investors' Protective Association; (7) Railway Business Association; (8) National Industrial League; (9) Paul M. Warburg; (10) Glenn E. Plumb.

Each of these plans bears the impress of the interests making the proposal, and all contemplate private ownership under private operation with adequate government regulation, with the exception of that proposed by Glenn E. Plumb, which favors government ownership under private operation of railroad employes.

In each case consolidation of competing lines is recommended in some form or other, under close government supervision. The issuance of securities is without exception placed under Federal regulation. The authority of the state to regulate intrastate matters, either directly or indirectly, is recognized, but somewhat limited. In most instances the question of industrial relations is placed in charge of Federal boards, while general regulation is delegated to the Interstate Commerce Commission or to judicial bodies similarly constituted. It is quite evident that the tendency is toward handling the railroads as a National proposition, even though under private ownership.

It is estimated by the best authorities who are in touch with the situation that it will take at least five years to put into operation any policy which Congress may adopt.

THE BIG ISSUE IS RATES

The guarantee by the Federal Government of sufficient revenue to assure reasonable returns to the railroads is either directly authorized or is implied by the provisions of each plan presented thus far.

Assuming that present wage scales and cost of materials prevail following the return of the roads to the owners, provision of adequate revenue to meet operating expenses and reasonable dividends can be made only by an advance in freight rates. It is the general opinion among those who are giving the matter serious consideration that even though an increase in rates is not made before the end of the current year, such action is unavoidable early in 1920.

SAND AND GRAVEL SHIPPERS ALREADY BURDENED BY EXORBITANT RATES.

Sand and gravel producers have been seriously affected by the advance in rates made during the last year, which are admitted by the Railroad Administration to be excessive. Further advances in rates on sand and gravel must be prevented or the industry, as a shipping proposition, is lost to the wagon and truck trade; or, at best, the territory which may be served by rail transportation will be limited to extremely short hauls.

UNITED WE STAND, DIVIDED WE FALL!

A substantial increase in rates was prevented a few months ago by prompt action of the National Association, and while it is hopeless to expect to obtain any further reduction in rates at this time, yet the protests that we have made and the information that we have recently given the Railroad Administration and other departments of the Government have allayed the matter temporarily. But unless we continue the agitation and stand ready to present a united front against all proposed advances, the good results that have thus far been accomplished will be lost.

The National Association, through its Executive Committee, will keep in constant touch with the situation, both as to proposed legislation and rate matters, and every effort will be made to handle satisfactorily the questions arising, so far as they relate to the transportation of sand and gravel. However, in order that the most effective results may be attained, it is essential to have the moral and financial support of every sand and gravel producer in the United States.

The question, you must admit, is a vital one, and if not given proper attention at the right time will mean ruin to every sand and gravel plant now in existence depending on railroads for shipment. Will you not help meet the impending danger by giving the Association representing your industry the benefit of your membership?

E. GUY SUTTON,
Secretary National Association of Sand and Gravel Producers.

Indianapolis, Ind., June 4, 1919.

Congress Has Bill to Tax Imported Magnesite

WASHINGTON, D. C.—Representative Hadley, of Washington, has introduced a bill levying a tariff of ¾ cent a pound on magnesite ore and a 25 per cent ad valorem tax on magnesite brick. The measure, he said, was designed to protect Washington and California producers against low cost foreign products.

Western magnesite producers completed arguments before the house ways and means committee June 17 in favor of protection of their industry. Roy N. Bishop of the Northwest Magnesite Co., said a levy of $25 a ton on finished magnesite was necessary for "an even break on the Atlantic seaboard with the Australian product." He admitted, says a dispatch, that his company would receive greater benefits from such a tariff than other companies because it could produce finished magnesite cheaper.

Get Magnesia and Salts from Valley Quarry

VALLEY, WASH.—The American Mineral Co. is making a product from the magnesite from the Allan quarry, that is said to be as fine magnesia as can be produced; also a by-product in the shape of salts, that is said to be as good for medicinal purposes as the Epsom salts. The laboratory is under chemist Paul Deming, who has been with the company for two years.

Relation of Lime to Fertilizer Use

Synopsis of an Address Delivered by Elmer O. Fippin, Professor of Soil Technology, at a Conference of Fertilizer Sales Managers, Northern and Eastern Divisions, at Cornell University, June 9-13, 1919

LIME USED IN THE BROAD AGRONOMIC SENSE to include both caustic and carbonate forms is one of the materials fundamentally necessary to create that condition in many soils under which commercial fertilizers are able to give their largest effect. The reasons why lime exercises such an underlying influence on the effect of fertilizers are:

First, it neutralizes active acids in the soil and thereby changes the chemical balance in a direction favorable to most of the crops that are agriculturally important, and especially for the clovers and alfalfa, and to a less extent for most of the grain, grass and vegetable crops. Similarly, this correction of acidity exercises a most significant beneficial influence on the microscopic plants in the soil that are concerned with fertility. Among these are the organisms that promote the decay of organic matter and the formation of that most valuable form commonly known as humus.

Second; it; promotes the activity of those organisms, that change ammonia into nitric acid which is the form of nitrogen most acceptable to the crops comonly grown on well-drained soils. In the third place, it is necessary for the best growth of those organisms that have the power to fix the free nitrogen in the air in combinations that are suitable for plants. This includes both organisms that live on the roots of legumes and those that live independent in the soil on the vegetable matter. This effect of lime materials to correct acidity with the beneficial results that follow such correction, is perhaps the outstanding reason for the use of lime on soils, but it is by no means the only effect.

Fourth; there are instances where it seems evident that the use of lime materials supplies calcium or both calcium and magnesium to the plant for food purposes. This is especially true with plants of the clover-alfalfa type that use a large quantity of lime. In addition to this direct food function, lime maintains a condition in the soil that tends to increase the availability of the plant nutrients already present.

Fifth; the presence of a reasonable amount of lime improves the general sanitary conditon of the soil by preventing the development or changing the character of many constituents that may depress crop yields. It also prevents certain plant diseases that thrive under acid-soil conditions. Best known among these is the club root of the cabbage and related plants, the common remedy for which is an application of lime to the soil.

Illustrations of the Effects of Lime

An examination of the experimental data in the Northeastern States reveals

Elmer O. Fippen

PROFESSOR FIPPIN is one of the best known soil experts in this country. He is personally familiar with the soil conditions whereof he writes because for five years he was engaged in making soil surveys for the United States Department of Agriculture.

the fact that very generally the presence of lime has increased the efficiency of both commercial fertilizers and stable manure over their effect without the use of lime.

At the Cornell Experiment station in New York in the study of the efficiency of different forms of lime, including both caustic and carbonate forms on the succession of nine non-legume crops, lime has produced an increase in yield on heavily fertilized land ranging from a few per cent up to 27 per cent. From other data where clover or alfalfa is included in the succession, the increases from the use of lime range from 50 per cent up to 300 per cent or more. A summary of tests throughout the southern section of the state involving the use of lime with acid phosphate and manure reveals an increase of about 1,500 lbs. of hay from the use of lime alone and 480 lbs. of hay from the use of acid phosphate alone. The combination of lime with acid phosphate has produced an increase of 2,400 lbs. of hay per year.

At the Ohio Experiment Station, the results shown in the table on the following page have been secured in increased money return from the use of 2,000 lbs. of caustic lime.

One significent point in these Ohio data is the comparative effect of lime where different carriers of nitrogen are used. Where the carrier is sulfate of ammonia, an acid residue is left in the soil, and the lime has had its largest effect, producing a total increase in value of $11.80 per rotation as compared with $4.51 per rotation where nitrate of soda has been the carrier of nitrogen.

On the Scottsburg field in southern Indiana on gray silt loam soil, the investigations indicate that both phosphoric acid and lime are needed; and by far the largest returns are secured where the lime is combined with the phorphorus.

In Illinois a summary of the investigations on three fields in the middle and northern parts of the state on the better soils shows an increase of $21.24 due to the addition of lime to a complete fertilizer, or an average of $1.77 per year throughout the entire period of 12 years. On the gray silt loam of the southern part of the state, the addition of a lime to a fertilizer of raw rock phosphate and potash over a period of 14 years has produced a total increase of $79.84 or $5.70 per year.

Data of similar tenor have been secured at both the experiment stations of Kentucky and Tennessee.

At the Rhode Island Experiment Station, the use of burned lime in connection with nine different carriers of phosphorus over a period of 19 years and with a variety of crops, has produced an increase of $22.30 per acre due to the use of lime. Where double super-phosphate was used, the total increase was $194.70.

At the West Virginia Station, over a period of 15 years, in which four crops of legumes, eight of grain, two of timo-

thy and one of potatoes have appeared, the use of lime in the caustic form when added to a complete fertilizer of nitrogen, phosphoric acid and potash, has produced an increase of 6,265 lbs. of crop over the same plant-food elements used alone. It is interesting to observe that at this same station the use of the same quantity of lime with manure has produced an increase in the same period of 17,210 lbs. of crop over the yield with manure alone. This result is not unusual but commonly occurs where the soil is seriously acid. In connection with the last clover crop in the series, the use of lime with a complete fertilizer has produced an increase in yield in one year of 2,680 lbs. of hay as compared with the use of a complete fertilizer alone.

EFFECT OF LIME AND FERTILIZERS ON CROP YIELDS, AND NET RETURNS AT THE OHIO AGRICULTURAL EXPERIMENT STATION—AVERAGE OF 13 YEARS

Plot No.	Treatment	—CORN— Grain bu.	—CORN— Stover bu.	—OATS— Grain bu.	—OATS— Stover bu.	Clover hay lbs.	Total value of increase	Cost Treatment excluding manure	Net gain or loss per acre
15	Limestone, 1,780 lbs.	5.26	121	0.32	28	588	$ 4.76	2.70	2.06
14	Caustic lime, 1,000 lbs.	7.74	461	2.63	218	771	7.88	3.00	4.88
6	Limestone, 1,780 lbs. Manure, 8 tons	20.26	724	6.24	426	1,156	16.11	2.70	13.41
3	Caustic lime, 1,000 lbs. Manure, 8 tons	19.48	728	5.72	329	1,105	15.30	3.00	12.35
26	*Manure, since 1909, 8 tons	17.34	816	3.58	202	715	12.30		
17	Caustic lime, 1,000 lbs. Acid phosphate, 320 lbs. Muriate of potash, 40 lbs.	20.13	829	5.40	202	1,264	16.17	6.60	9.57
21	Acid phosphate, 320 lbs. Muriate of potash, 40 lbs.	14.78	611	3.14	176	413	9.60	3.60	6.00
20	Acid phosphate, 320 lbs.	8.55	315	1.19	37	271	5.37	2.60	2.77

*Previous to 1909 a complete fertilizer was used.

The cumulative effect from the use of lime was shown by data covering a period of 13 years at the Ohio station, in which the rotation is corn, oats and clover. The use of both carbonate forms of lime with and without commercial fertilizer or manure has produced consistent increases in the crops throughout the period. The effect from the caustic forms of lime has been at least as good as those in the carbonate form in equivalent quantity. Dividing the 13 years in nearly two equal periods, it is found that the yield of all of the crops is substantially larger in the second half of this period than in the first half, and the increase in the second period is particularly marked where lime material is used with commercial fertilizer or manure.

Fineness of Ground Limestone

Bearing upon the importance of the fineness of limestone data collected at the Pennsylvania and New Jersey stations show a wide difference in favor of the finer materials. This fact has been brought out by the figures in the table in the next column above.

In this short table the availability of 100-mesh material is taken as 100. From this it appears that when measured by the efficiency in producing the growth of crops, material of ⅛-in. size is only 5 per cent as efficient as material having particles of 100-mess size.

Bearing on the extent of the need of lime, it was pointed out that in New York State at least 75 per cent of the agricultural land requires the use of some form of lime as an essential factor in the maintenace or up-building of its productiveness, and that the use of lime in some quantity is desirable on at least 90 per cent of the cultivated area. The need for lime is nearly, if not quite, as great in any of the states east of the Mississippi, and from data already presented by the agricultural experiment stations it is apparent that a similar need for lime extends west of the Mississippi at least as far as the eastern sections of the states of Kansas and Nebraska. Wherever the rainfall is high in the districts west of that section, lime is also likely to be required by the soil in good farm practice.

Lime with humus may be looked upon by the farmer and the fertilizer industry as the frame to a picture. The increases in yield that are possible from the use of fertilizer is the picture, but this picture does not show off to good advantage until it is framed by the proper application of lime and the presence of a reasonable quantity of humus in the soil. Since the use of lime is often necessary for the growth of those crops by means of which humus is best maintained, lime thereby becomes the foundation of this frame for the fertilizer picture.

	8 mesh	20 mesh	60 mesh	100 mesh
Solubility in carbonated water	28	45	57	100
Value in correcting acidity	18	27	57	100
Value in the formation of nitrates	12	56	94	100
Value in the growth of plants	5	22	69	100

Cooperation Urged

It is up to the fertilizer trade to see that their fertilizer picture is properly framed in the hands of the farmer by the wide use of lime and the maintenance of humus in the soil. The key-note in the fertilizer trade, as in all other lines of commercial activity, is service as measured by the returns that may be secured by the consumer. There should be the most cordial cooperation between those persons concerned with the use of fertilizers and those interested in lime materials, and of both of these with all agencies concerned with agricultural practice.

Soda and Sulphate Pulp Industries

THERE HAS BEEN BROUGHT to the attention of the chemical bureau of the Lime Association certain difficulties experienced by a very large southern pulp mill in its use of lime. The weekly letter of the Lime Association states further that the trouble complained of was a lack of causticity combined with poor settling qualities.

"Due consideration of the surrounding conditions brought out the fact that this particular paper company was using only one-half enough lime to satisfy the theoretical reaction sought and only one-third enough lime to constitute good practice in this industry. The lime in question was an excellent high calcium lime. This gives an illustration again of how we can benefit the users of our product and ourselves by gaining a more intimate knowledge of the uses to which our product is being applied.

"The lime manufacturer in this case will be given some information as to the burning of his lime for the pulp industry that will improve it for causticizing purposes and the paper company will be shown that the restricted use of lime which has been its practice, has slowed down its production in such a manner as to cost it several times as much as the entire expenditure for lime in this process.

"Those of you who supply lime to this class of pulp mills will be interested to know that the slowing down of production due to false economy of using too little lime, may readily cost the mills from fifteen to twenty times as much as the entire expense for lime were proper quantities used.

"Lime that is to be supplied for causticization should be burned considerably higher than lime intended for building purposes. Otherwise limes which show excellent analyses so far as impurities are concerned, may fail absolutely in giving satisfaction due to soft burning and the production of what may be known as 'fat' lime of poor settling qualities."

Crushed Stone Industry Biggest in Volume in Carthage District

Stronghold of Building and Monument Industry Fast Becoming Crushed Stone Producer

THE TOTAL QUANTITY OF LIMESTONE used for all purposes produced in the Carthage district, Jasper County, Mo., in 1918, was practically the same as in 1917, although the value of the output decreased 13 per cent, according to statistics furnished by the producers to G. F. Loughlin, United States Geological Survey, Department of the Interior. The total sales in 1918 were 70,820 short tons, valued at $339,898; in 1917, 70,600 short tons, valued at $392,443. The details of production are as follows:

Limestone and Marble sold at Carthage, Jasper County, Mo., in 1908-1918

Year	Number of producers	Building stone (rough and dressed) Quantity (cubic feet)	Building stone (rough and dressed) Value	Monumental stone (rough and dressed) a Quantity (cubic feet)	Monumental stone (rough and dressed) a Value	Curbing	Flagging	Rubble	Other b	Total value
1908	8	431,576	$280,249	.....	.....	$5,238	$3,602	$2,682	$17,826	$309,597
1909	8	481,274	334,715	.....	.....	1,263	6,232	3,791	24,001	370,002
1910	10	502,161	347,244	.....	.....	1,767	7,229	2,945	23,571	382,756
1911	9	427,974	293,470	.....	.....	2,427	2,431	2,596	23,865	324,789
1912	8	404,685	268,930	.....	.....	670	2,878	4,885	28,087	305,450
1913	7	346,421	236,524	.....	.....	.....	2,367	1,500	18,564	258,955
1914	7	280,046	206,554	.....	.....	.....	2,883	1,951	21,426	232,814
1915	7	367,950	384,959	.....	.....	(c)	2,614	c1,220	25,471	414,264
1916	7	426,408	497,357	25,232	$22,054	(c)	1,684	2,675	20,029	543,799
1917	7	313,904	302,411	49,819	58,809	.....	1,387	1,030	d28,806	e392,443
1918	8	236,885	239,418	26,387	31,789	.....	931	1,814	d65,937	e339,898
Average price....	1918		$1.01		$1.21	.....	.....	.....	.....	.....
Percentage of increase or decrease		—24.5	—20.8	—47.0	—45.9	.....	—32.9	+76.1	+128.9	—13.3

a Prior to 1916 included under "Other."

b Includes stone used for monumental work (prior to 1916), crushed stone, stone sold to glass factories, blast furnaces, sugar factories, etc.

c Curbing included in flagging; rubble includes riprap.

d Represents 33,875 short tons of stone in 1917; 45,677 short tons in 1918.

e Represents about 70,600 short tons in 1917; about 70,820 short tons in 1918.

Building and Monumental Stone

The Carthage district ranks next to the Bedford-Bloomington district, Ind., in the production of limestone used for building, although its output of building stone was only about 1 per cent of that of the Indiana district. The quantity of building stone reported is the smallest since statistics showing quantity have been compiled by the Survey, and the value is less than that of any preceding year except 1913 and 1914.

Of the total output of the district in 1918, 263,272 cubic feet (about 21,770 short tons), valued at $271,216, was high-grade building and monumental stone. The output of this class of stone in 1917 was 363,723 cubic feet (about 30,000 short tons), valued at $361,220, a decrease of 27 per cent in quantity and 25 per cent in value for 1918. The stone sold for building in 1918 amounted to 236,885 cubic feet, valued at $239,418, a decrease of 25 per cent in quantity and 21 per cent in value. These decreases in percentages are strikingly less than corresponding decreases in the Bedford-Bloomington district of Indiana, which were 60 per cent in quantity and 44 per cent in value.

The average price per cubic foot for building stone was $1.01 in 1918, 5 cents more than in 1917. Of the building stone sold in 1917, 93,964 cubic feet, valued at $142,061—$1.51 per cubic foot—was dressed stone, whereas in 1918 the dressed stone reported as sold amounted to only 37,861 cubic feet, valued at $71,760—$1.90 per cubic foot. This decrease of 60 per cent in quantity of dressed stone sold tended to reduce the total value for the district. The rough building stone decreased from 219,940 cubic feet, valued at $160,350—73 cents per cubic foot—to 199,024 cubic feet, valued at $167,658—84 cents per cubic foot.

The stone sold for monumental work, which amounted to 26,387 cubic feet, valued at $31,789, decreased 47 per cent in quantity and 46 per cent in value. The average value was $1.17 in 1917 and $1.21 in 1918. Stone classified by the quarrymen as marble and included in the totol amounted to 110,011 cubic feet, valued at $131,023.

Eight companies, one more than in the last six years, reported operations in 1918. These were the Carthage Building & Stone Co., Carthage Marble & White Lime Co., Carthage Quarry Co., Consolidated Stone & Marble Co., the Missouri Quarries Co., the Spring River Stone Co., the Carthage Crushed Limestone Co., and the Independent Gravel Co., all of Carthage. The statistics given do not include the value of the rough stone sold by the quarrymen for crushing; the value given for this stone is its value after crushing.

The producers that made statements regarding trade conditions in 1918 reported that business was poor and unsatisfactory, with little demand, and labor scarce and high, costing 25 per cent more than in 1917. Supplies were also reported as 25 per cent higher. The principal trade change reported was the taking over by the Missouri Quarries Companies of the quarry operated during the last few years by John Gill & Co.

The Carthage stone is sold principally in Missouri and the neighboring states of Arkansas, Oklahoma and Kansas, but it has also been shipped west to California, east to New York, north to Illinois, Wisconsin, Michigan, Minnesota, and Canada, and south to Beaumont, Dallas and Houston, Texas.

Crushed and Pulverized Stone

Though the building and monumental stone sold in the Carthage limestone district amounted to 70 per cent of the total value, nearly 65 per cent of the total quantity was sold in the form of broken, crushed, and pulverized limestone and a small quantity in the form of flagging. The total quantity of flagging ,rubble and crushed and pulverized stone sold in 1918 was 49,095 short tons, valued at $68,682; in 1917 it was 35,594 short tons, valued at $31,223, an increase of nearly 38 per cent in quantity and of nearly 120 per cent in value. The average price per ton of this stone in 1918 was $1.40; in 1917 it was 88 cents.

Of the quantity stated above 2,850 short tons, valued at $1.814, represented sales of rubble; 22,902 short tons, valued at $42,819, was stone sold to smelters, sugar factories, glass works, and powder mills; for agricultural use, and, as a substitute for whiting or chalk, or for filler, principally in the manufacture of soap, paint, putty, talc, and rubber; and the remainder was sold for flagging, concrete, and road metal.

Hot Air Best for Blowing Concrete Mixture

WASHINGTON, D. C.—Officials of the Bureau of Standards are now conducting experiments for the purpose of determining the value of different mixtures of concrete made with the Brown atomizer. This apparatus consists of a rotary mixer and a device for blowing the mixed concrete through the hose. The hose is directed by the operator to the form or walls where the concrete is to be placed. Results show that concrete blown with hot air is superior to others, and the experiments will be continued during the coming months.

Itemized Cost Report of Producing Crushed Stone

THE NATIONAL CRUSHED STONE ASSOCIATION, A. P. Sandles, secretary, Columbus, Ohio, has sent out some cost blanks like the following. Mr. Sandles states:

"Herewith is a copy of a classified itemized cost sheet on crushed stone production. **Study carefully.** At considerable expense, expert accountants worked out this chedule. My understanding is that the government thinks well of this method of arriving at cost price.

"A well organized quarry company has complied with our request to fill out this blank from its actual records for the month of April. During that month no repairs were made. Without estimating depreciation, cost is shown to be 51 cents per ton. Depreciation is estimated at 16 cents per ton, making total cost 67 cents."

It should be noted that these costs are for **one** month only, and for a favorable operating month at that. The average cost for 12 months might be considerably higher.

Mr. Sandles proposes to collect similar data from all members for confidential use of the association. Some exceedingly valuable information can be gained in this way if these costs can be studied in relation to operating conditions; for a summary of the facts would contain some invaluable suggestions for reducing costs, based on the experience of the low cost men and some suggestions for avoiding unnecessary expense where possible.

The most good, however, that will come from this is likely to be the revival of interest in cost-keeping and the elimination of inaccurate and deficient cost-keeping methods. Therefor all producers are urged to send in these data to the Association, for even if they are well satisfied with their own cost systems and costs, they may yet be the means of opening the eyes of some other operator who doesn't yet know what his costs are, or about what they ought to be.

Cost Sheet Filled Out From Actual Records

Labor Costs

	Per Ton	
Electrical Expense	.0035	
Stripping	.0164	
Shooting and Drilling	.0226	
Operating Crusher Plant	.0459	
Engineers, Locomotives	.0158	
Track repair	.0107	
Barn Men	.....	
Crusher repairs	.0010	
Car repairs	.0068	
Locomotive repairs	.0009	
Repair, Motors	.....	
Repair, Steam Engines	.....	
Repair, Steam Boiler	.....	
Repairs, drill, 1	.....	
Repairs, drill, 2	.....	
Repairs, drill, 3	.....	
Repairs, drill, 4	.....	
Repairs, drill (small), 1	.....	
Repairs, drill (small), 2	.....	
Repairs, drill (small), 3	.....	
Repairs, drill (small), 4	.....	
Repair, shovel (steam), 1	.....	
Repair, shovel (steam), 2	.0137	
Repair, shovel (steam), 3	.....	
Repairs, Locomotive crane, 1	.....	
Repairs, Locomotive crane, 2	.....	
Miscellaneous Labor	.0165	
Handling coal	.0007	
Quarry foremen, Supt.	.0036	
Office men	.0020	
Loading cars	.0063	
Plant Maintenance	.0031	
Operating shovels	.0503	.2198

Material Expense

Explosives	.0052	
Oil and Greases	.0042	
Miscellaneous supplies	.0077	
Crushing expense	.....	
Quarry Expense	.....	
Electric Power	.0267	
Steam Power	.0543	
Express in on materials	.0010	
Freight in on materials	.0036	
Repair, Drill (large), frt. on coal	.0192	
Repair, Drill (large), 2	.....	
Repair, Drill (large), 3	.....	
Repair, Air Drill (small), 1	.....	
Repair, Air Drill (small), 2	.0004	
Repair, Air Drill (small), 3	.....	
Repair, Locomotives, 1	.....	
Repair, Locomotives, 2	.0009	
Repair, Locomotives, 3	.....	
Repair, Steam Shovel, 1	.....	
Repair, Steam Shovel, 2	.0113	
Repair, Steam Shovel, 3	.....	
Repair, Cranes	.....	
Repair, Cars	.0018	
Repair, Jaw crusher, 1	.0030	
Repair, Jaw crusher, 2	.....	
Repair, Rolls, 1	.....	
Repair, Rolls, 2	.....	
Repair, Mchry., Elevators, etc.	.0140	
Repair, Motors, 1	.....	
Repair, Motors, 2	.....	
Repair, Motors, 3	.....	
Repair, Motors, 4	.....	
Repair, Motors, 5	.....	
Repair, Motors, 6	.....	
Repair, Motors, 7	.....	
Repair, Motors, 8	.....	
Repair, Tracks	.....	
Repair, Auto	.0006	
Repair, Dwellings	.....	
Repair, Buildings	.....	
Depreciation, Steam Shovel, 1	.....	
Depreciation, Steam Shovel, 2	.0174	
Depreciation, Steam Shovel, 3	.....	
Depreciation, Locomotive, 1	.....	
Depreciation, Locomotive, 2	.0037	
Depreciation, Locomotive, 3	.....	
Depreciation, Locomotive, 4	.....	
Depreciation, Crusher Equipment	.....	
Depreciation, Quarry Equipment	.0130	
Depreciation, Stone Mchy., Bldgs., Elevators	.0952	
Depreciation, Screens, etc.	.0082	
Depletion of Land	.0060	
Reserve for future contingencies	.0063	
Reserve for obsolescence	.0063	
Shut-down expense	.....	
Electrical Supplies	.0014	
Telephone	.0005	.3130

Selling Expense

Advertising	.0036	
Commissions	.....	
Postage	.0020	
Salaries, Salesmen	.0150	
Salaries, Office men	.0120	
Salaries, Stenographers	.0065	
Stationery	.0103	
Traveling Expenses	.0117	
Telephone	.0014	
Telegraph	.0004	
Auto Expense	.0025	.0654

General Administration Expense

Salaries, Officers	.0325	
Salaries, Office men	.0120	
Office Rent	.0037	
Office Expense	.0010	
General Expense	.....	
Legal Expense	.....	
General Traveling Expense	.0004	
Association Dues	.0062	
Taxes (County, State and War)	.0042	
Charity	.....	
Interest, General	.....	
Interest, Bonds	.....	
Interest, Preferred Stock	.....	
Com. on Bonds and Pref. Stock	.....	
Liability Insurance	.0086	
Telephone	.0020	
Depreciation Office Equipment	.0013	.0719
Total		.6701

"Macadam and Maintenance" Wins Ohio

THE CRUSHED-STONE men of Ohio, under the able leadership of Secretary Sandles of the Ohio Macadam Association, have achieved a very remarkable victory in Ohio. They have succeeded in having passed a state road law which will insure the maintenance of macadam roads already built.

Certain interests which would discard the macadam type of road entirely fought the passage of the act to the last extremity. The whole story would be a long one. It is briefly and modestly summarized by Mr. Sandles himself in Bulletin 25 of the National Crushed Stone Association as follows:

"Ohio Legislature has enacted new road law. In House no votes against it. In Senate two votes negative. Governor vetoed. It was passed over his veto. It provides a strong maintenance program for roads now improved. Ohio farmers stood solidly for it."

Ten Oil-Bearing Concrete Ships Building in Texas

PORT ARANSAS, Texas—The McDonald Engineering Co. of Chicago is constructing forms for 10 concrete ships at its shipyards on Harbor Island, just across the channel from Port Aransas. It will build these vessels for the French & Canadian Transporting Co. Each of the ships will cost approximately $200,000 and will be 53 ft. wide, 21 ft. deep, and 300 ft. long. They will be used for transporting oil. The cement for these vessels is manufactured in San Antonio. They will have 2,200-ton capacity, deadweight, that is a carrying capacity of 14,000 or 15,000 blls. of oil. They will be made in sections and reinforced with steel. The frames and scaffolding are well under headway, and the work is progressing rapidly.

There are several concrete oil tanks to be constructed with a holding capacity of 55,000 barrels. The first one of these structures is nearly completed.

Army Equipment for Highway Building and Maintenance

Tractors, Road Rollers and Other Equipment to Be Returned from France

WASHINGTON, D. C.—At the request of the Department of Agriculture, the War Department has ordered to be returned from France as soon as possible a large quantity of engineering equipment to be distributed by the Department of Agriculture, through the Bureau of Public Roads, to the states, for use in the construction and maintenance of Federal aid highways.

This equipment will be distributed to the states without charge, in accordance with recent legislation empowering the Secretary of War to turn over to the Secretary of Agriculture surplus military equipment not needed for military purposes, but valuable in highway construction work. The equipment will be apportioned on the basis of the allotments in the Federal Aid Road Act, in the same way that 20,000 army motor trucks are now being distributed by the Bureau of Public Roads at the request of the state highway departments.

The equipment which the Secretary of War has been requested to return from France includes about 1,500 caterpillar tractors; about 400 road rollers, steam and gas driven; and a large number of concrete mixers, road graders, elevating graders, rock crushers, industrial locomotives, industrial railway track, dump cars, steam shovels, hoisting engines, electric motors and quantities of smaller equipment.

In his letter requesting the return of this equipment the Secretary of Agriculture said:

"The highway-construction program which the Federal Government and the states propose to begin immediately is the largest public undertaking contemplated in the near future. It offers an immediate field for the employment of labor and the use of materials that will help to stabilize business along a number of lines. The work has been expanded so suddenly that it has not been possible to make adequate provision for furnishing the necessary equipment, and previously all the available supply was absorbed by the demands of the War Department. * * *

"I am sending you this list as a result of a conference which I have just held with the executive committee of the American Association of State Highway Officials, at which it was represented that the various states are very anxious to secure additional equipment of the kinds indicated.

"I am thoroughly in sympathy with the efforts that are being made by the War Department to aid returning soldiers in securing employment, and I am convinced that, if the equipment and supplies listed are made available, it will facilitate highway construction and thereby stimulate the employment of labor."

Phosphate-Rock Industry in 1918

THE PHOSPHATE-ROCK INDUSTRY in the United States may be said to have "marked time" in 1918, for the quantity of rock sold differed only about 4 per cent from that sold in 1917. For the whole country there was a decrease in output of 93,527 tons, or 3.6 per cent, but a gain in total value of $443,379, or 6 per cent.

State.	1917			1918		
	Quantity (long tons).	Value.	Average price per ton.	Quantity (long tons).	Value.	Average price per ton.
Florida:						
Hard and soft rock	18,608	$159,366	$8.56	70,383	$524,178	$7.45
Land pebble	2,003,991	5,305,127	2.65	1,996,847	5,565,928	2.79
	2,022,599	5,464,493	2.70	2,067,230	6,090,106	2.96
South Carolina						
Land rock	33,485	138,482	4.14	37,040	164,650	4.45
Tennessee:						
Brown rock	[a] 447,203	1,920,533	4.29	[a] 374,535	1,917,546	5.12
Blue rock	65,904	205,820	3.12			
	513,107	2,126,353	4.14	[a] 374,535	1,917,546	5.12
Western States	[b] 15,096	41,756	2.77	[b] 11,955	42,161	3.53
	2,584,287	7,771,084	3.01	2,490,760	8,214,463	3.30

[a] Includes several thousand tons of brown rock from Kentucky.
[b] Includes, 1917: Idaho, Utah, and Wyoming; 1918: Idaho and Utah.

The quantity of phosphate rock marketed in 1918, according to R. W. Stone, of the United States Geological Survey, Department of the Interior, was 2,490,760 long tons, valued at $8,214,463, as compared with 2,584,287 tons, valued at $7,771,084, in 1917.

The table above shows Florida land pebble constituted 80 per cent of the output of the country and that the land-pebble output was 7,144 tons less in 1918 than in 1917, a slight decrease. Florida hard and soft phosphate, however, increased from 18,608 tons in 1917 to 70,383 tons in 1918, or 278 per cent. Most of this increase was made by a greater output of hard rock. The output of the state as a whole increased 44,631 tons, or 2 per cent. The statistics for Florida were compiled in co-operation with the Florida State Geological Survey. The output of South Carolina increased about 11 per cent, but that of Tennessee and Kentucky was 27 per cent less than in 1917. In the western states also there was a proportionately large decrease—from 15,000 tons in 1917 to 12,000 tons in 1918, or about 20 per cent.

The failure to make a greater output was due largely, it is believed, to the shortage of labor.

Gypsum Output in 1918

THE TOTAL QUANTITY of crude gypsum mined in the United States in 1918 was 2,056,462 short tons, a decrease of 639,764 tons, or 24 per cent, from the output of 1917, according to R. W. Stone, of the United States Geological Survey, Department of the Interior. The decrease was due to the reduction in building operations throughout the country required by the local and national governments.

The decrease in production was least in New York, where the output fell off only 12 per cent; in Oklahoma, Michigan and Ohio, the decrease was 20 to 26 per cent, or about the average for the country. Texas suffered the greatest reduction in output, or about 39 per cent. Utah was the only State that produced more gypsum in 1918 than in 1917.

Crude gypsum mined in the United States, 1917–18, in short tons.

State.	1917	1918
California	30,552	(a)
Iowa	461,864	327,927
Kansas	79,331	54,958
Michigan	375,803	286,768
New York	606,268	531,038
Ohio	270,538	199,456
Oklahoma	158,017	126,208
Texas	257,328	157,388
Wyoming	55,844	41,877
Other States [b]	400,681	330,842
	2,696,226	2,056,462

[a] Included with "Other States."
[b] Includes, 1917: Alaska, Arizona, Colorado, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Virginia; 1918: Arizona, California, Colorado, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Virginia.

U. S. Department of Labor Concludes There Will Be No Drop in Prices

Summary of Results of Extensive Investigation Justifies "Build Now" Advice

IN JANUARY, 1919, the Division of Public Works and Construction Development was organized as a branch of the Information and Education Service of the Department of Labor. Its purpose was to be the stimulation of the interest of the Nation in public and private construction with a view to the creation of buffer employment for labor during the period of transition of manufacturing industries from war to peace production. It was charged with the securing of data for the use of the construction industry, but its activities were also to comprehend a study of the economic conditions affecting industry as a whole.

In conformity with its purpose it has given wide publicity to the material which it has gathered on prices and price tendencies in the construction industry, and to such other information as it believed was of immediate value for the construction industry and for general industry. Its findings are contained in "Economics of the Construction Industry," now in press. The following is a brief summary of these findings, which it is hoped will provide conviction for those who, on the threshold of an era of business prosperity, still hesitate.

On the basis of its study it has come to the conclusion that construction in 1919 can be justified on financial grounds. It rejoices to find such a widespread acceptance of its view as is evidenced by the remarkable resumption of construction activity of the last three months. It looks to public officials and private and speculative builders everywhere to maintain or increase the present activity, for it feels that by so doing they will not only be securing a reasonable return on their investments, but that they will also be relieving the unprecedented shortage in housing, supplying needed employment, and allaying much of the industrial unrest incident to a period of readjustment.

The New Commodity Price Level

1. Most people believed that the high level of prices reached during the war was caused merely by the extraordinary demand for commodities which exceeded the supply. With the end of the war and with war demand a thing of the past, they quite naturally expected a sharp drop in prices and a price level approximating in a short time the prewar level.

2. It was also commonly believed that the industrial capacity of the world had been greatly expanded under the stimulation of war orders, and that this expansion would bring sharp competition between rival concerns in time of peace. Furthermore, it was thought that there would be after the war great armies of unemployed workmen, who would be compelled by necessity to accept work at low wages; that there would be sharp competition among the leading nations in international trade; and that buyers generally, looking forward toward an era of lower prices, would postpone buying. In the light of these considerations it was but natural for people to expect a great fall in prices, and even to fear an industrial panic.

However, the expected great fall in prices has not occurred, and it is not likely to occur for these reasons:

3. The rise in prices during the war was not merely the result of a great demand for goods and of a scarcity of certain goods. It was largely brought about by means of inflation of the currency by the governments at war and by the neutrals, either by the direct issue of paper money or by the issue of bonds. Although war orders are now largely a thing of the past, the extension of credits still exists as a continuing cause of high prices. There is little to indicate an early contraction of credits.

4. World production in general during the war, contrary to a widely held view, was not abnormally large. This is shown by statistics of world production of leading basic materials of industry such as coal, petroleum, iron ore, and of cotton, sugar, wool, wheat, and other agricultural products. Consequently the abnormal consumption of goods for war purposes has depleted the stocks of commodities of the world.

5. Armies of unemployed, in the United States at least, have not materialized, and an actual labor shortage is probable. Wages are not likely to fall.

6. Buyers since the armistice, although showing a desire to wait for lower prices, have been compelled to buy to meet their daily needs. During the war, because of scarcity of commodities and high prices or because of patriotic self-denial, they did not buy in advance of need, as is customary in an era of rising prices. Consumers' goods are in great demand and trade is now moving in great volume.

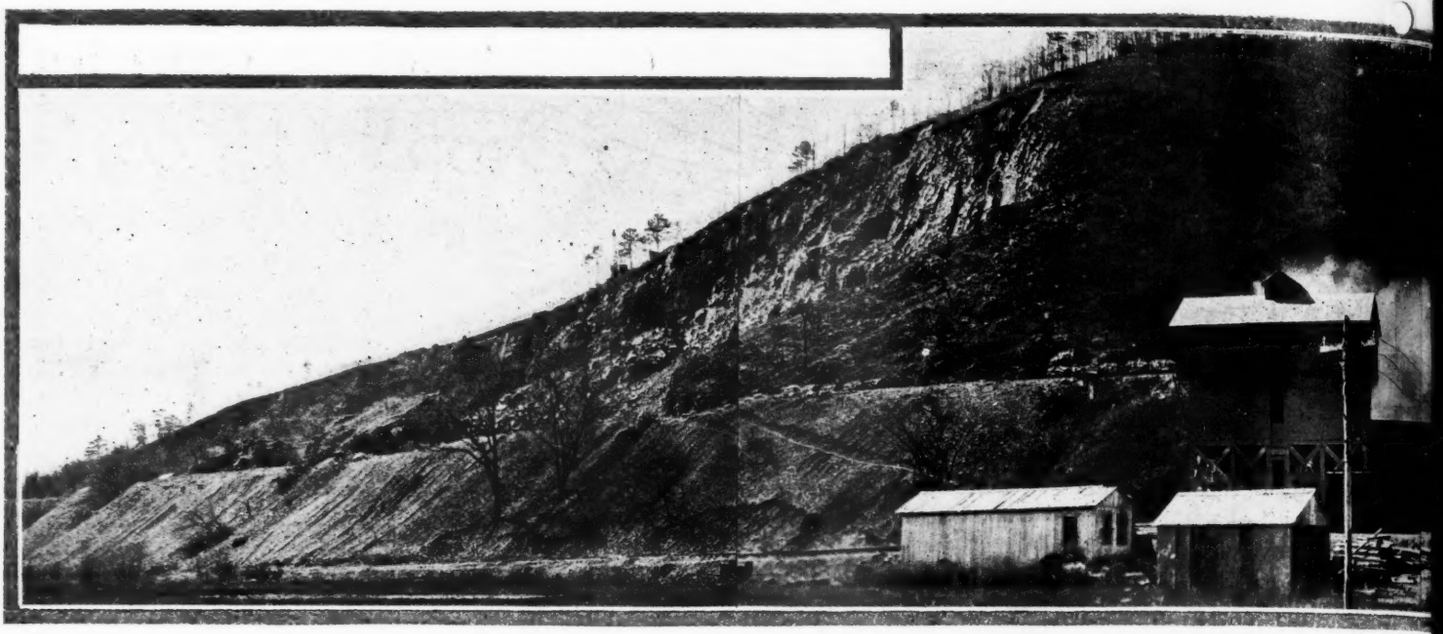
7. If the production capacity of industry should be greatly increased, lower prices would not necessarily follow. If there is a strong enough demand for commodities, prices need not fall, no matter in how large volume commodities are produced. There is every reason for expecting such a strong demand. The world is now suffering from a great shortage of durable goods—buildings, transportation facilities, and industrial equipment. Furthermore, people, both in the United States and Europe, have a stronger desire for consumers' goods than ever before. This is true partly because of the scarcity of certain goods during the war period, and partly because of the new experiences through which tens of millions have passed, which have awakened in them desires for goods and services they never enjoyed before. Along with greater production of goods there is likely to go further extensions of credits rather than contraction. Neither the credit system of the United States nor that of the world has reached the limits of its power of expansion.

8. Business men of the United States need not hesitate to plan for an immediate period of business prosperity. No period of depression and no collapse of values need to be feared. The man who goes full speed ahead will gain an advantage over his procrastinating competitor which will far outweight any possible slight decline in costs of production.

An Estimate

IT IS OBVIOUS that the teaching of aliens is not sufficient to make them members of America. To acquire the language is, of course, a necessary preliminary. But if they are ever to feel that they belong with us, the right hand of fellowship must be extended to them. The neighborhood spirit alone can create in them the spirit of America.

Friendliness is not only the soul of democracy but also the most successful method of securing practical results. The process of Americanization consists essentially not in learning a language but in acquiring a spirit.—Henry Jackson, Special Agent in Community Organization, Bureau of Education.



Plant of the Ladd Lime and Stone Co. Cartersville, Georgia

One of the Largest Producers of Agricultural Limestone in the South

SITUATED ON THE SOUTHEASTERN tip of the Central West limestone belt, the plant of the Ladd Lime and Stone Co., just west of Cartersville, Ga., occupies a strategic position to reach the agricultural section of northern and eastern Georgia. The plant, which was built four or five years ago, has several interesting features. It is a stone plant, however, and not a lime plant, as the name of the company would imply.

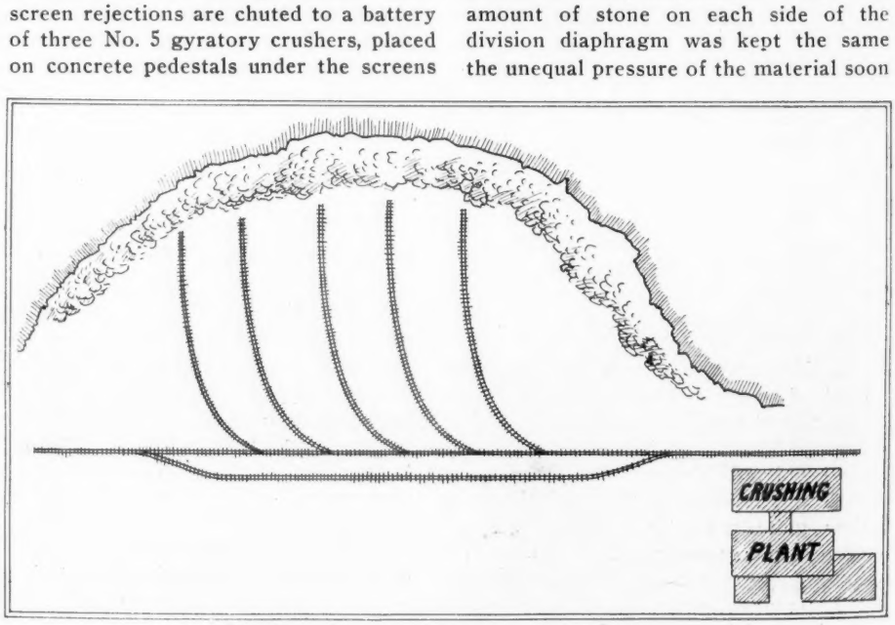
The quarry operation is simplified by having a side-hill location, as the view above shows. The stone is a mixture of high calcium and magnesium limestone. Large chunks of pure calcium-carbonate (calcite) crystals occur quite frequently. The deposit shows evidences of having been pretty well shaken up by nature at some time or other, so that no difficulties are encountered in working a face 100 to 200 ft. high by means of well drills and deep-hole blasting.

Hand loading on the piece work system with negro labor is the mode of getting out the stone. The small tram cars (about 3-in. yd.) are hauled out of the quarry by mules. The quarry track layout is very simple and quite efficient. The cars drop by gravity from the loading point almost to the connection with the main line, which is nearly on a level, allowing one mule to haul a string of several cars.

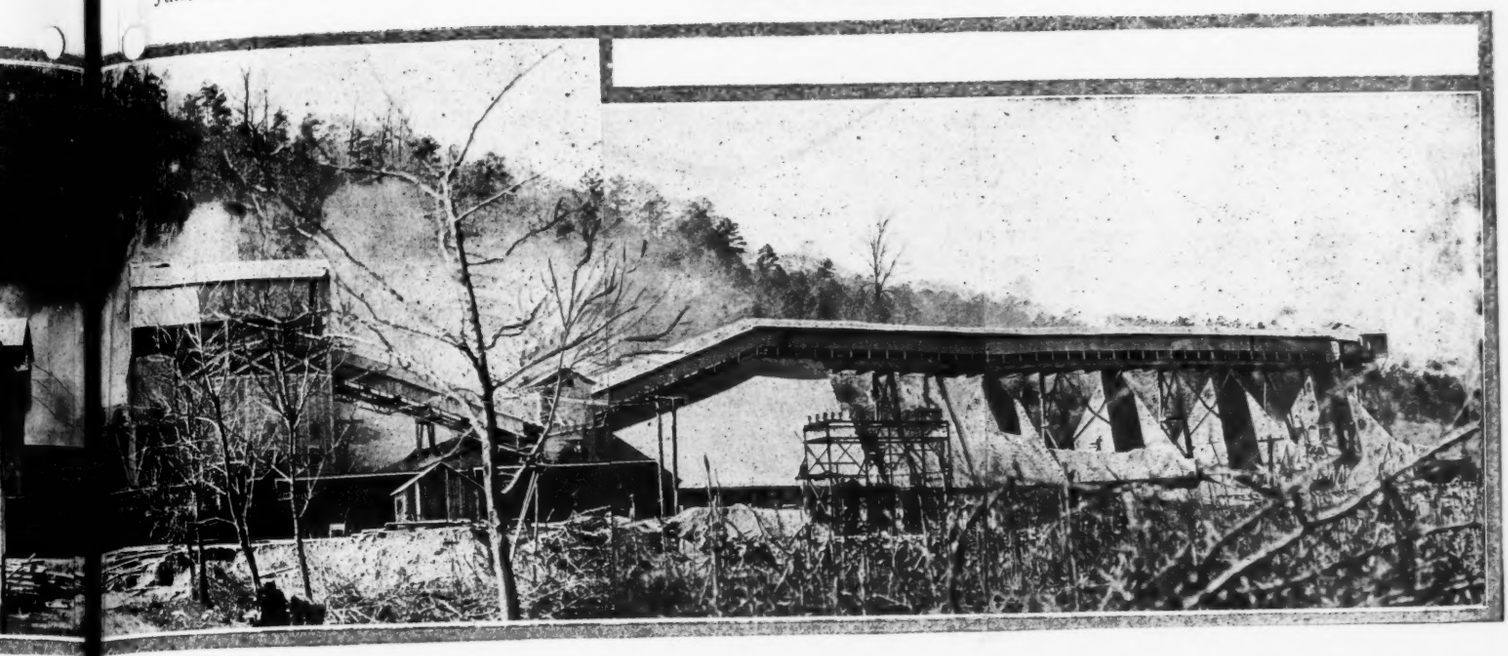
The initial crusher is a No. 27 gyratory (Kennedy), said to be one of the two or three crushers of this size in the south. The entire output of the initial crusher goes into an inverted Y-shaped chute to two No. 9 gyratories, either one or both of which may be used. A track is provided so that the quarry cars can be dumped into one of these crushers in case of a breakdown in the initial crusher.

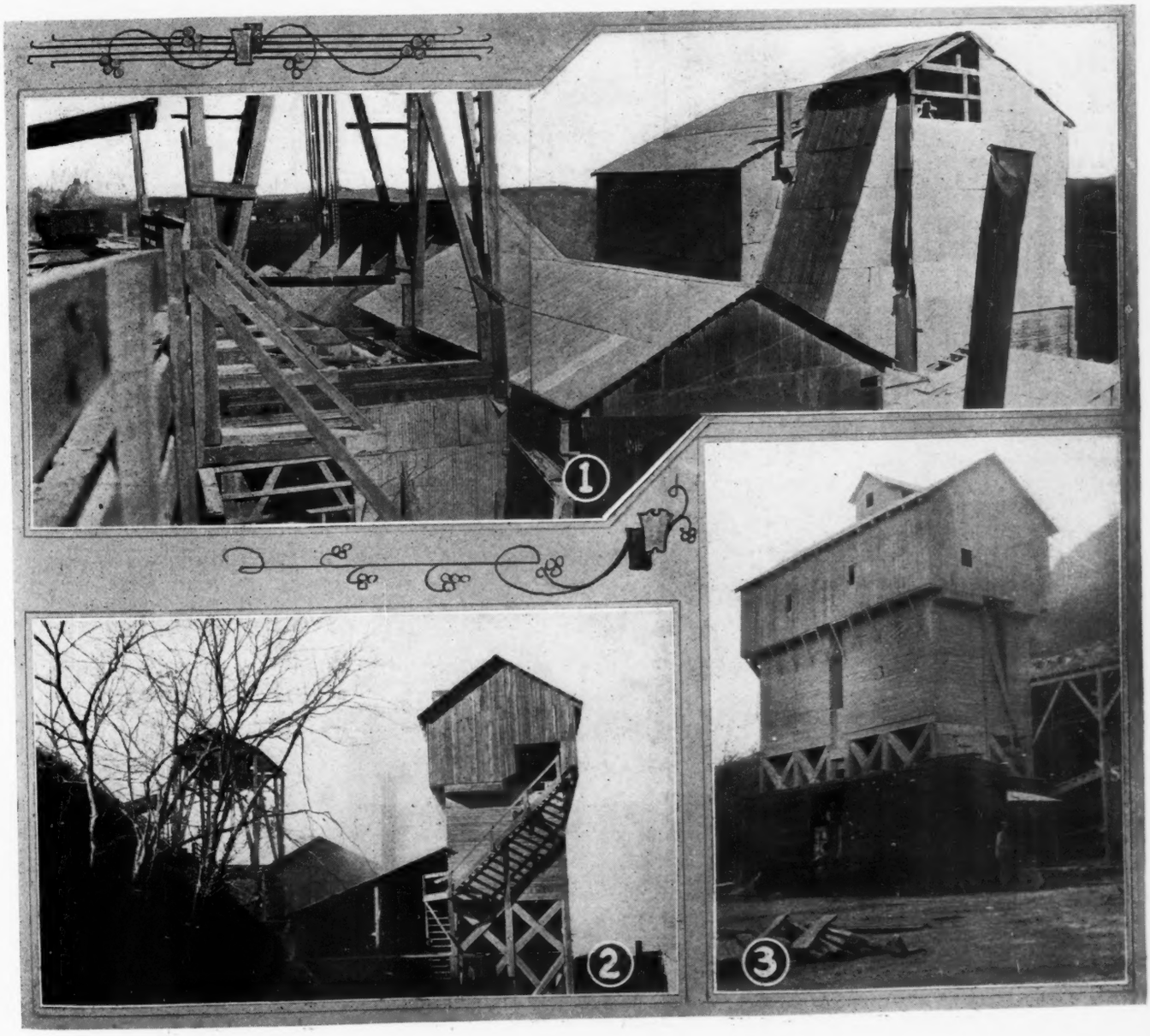
Both No. 9 crushers discharge to a bucket elevator pit, from which the stone is raised to the sizing screens. The screen rejections are chuted to a battery of three No. 5 gyratory crushers, placed on concrete pedestals under the screens and bins. The discharge of these crushers goes to a belt conveyor and hence back into the elevator pit at the No. 9 crushers.

Ground storage is provided for about 50,000 tons of stone by overhead conveyors and stock piles with underground conveyors in tunnels. The design of the stock-pile storage was faulty, however, in the attempt to divide the storage pile by means of vertical wood diaphragms as shown in the illustration. Unless the amount of stone on each side of the division diaphragm was kept the same the unequal pressure of the material soon



Simple quarry track layout—hand loading





1—Quarry track and initial crusher

2—Initial crusher with overhead chain hoist at left; pulverized limestone plant at right

3—Pulverized limestone plant and loading bins

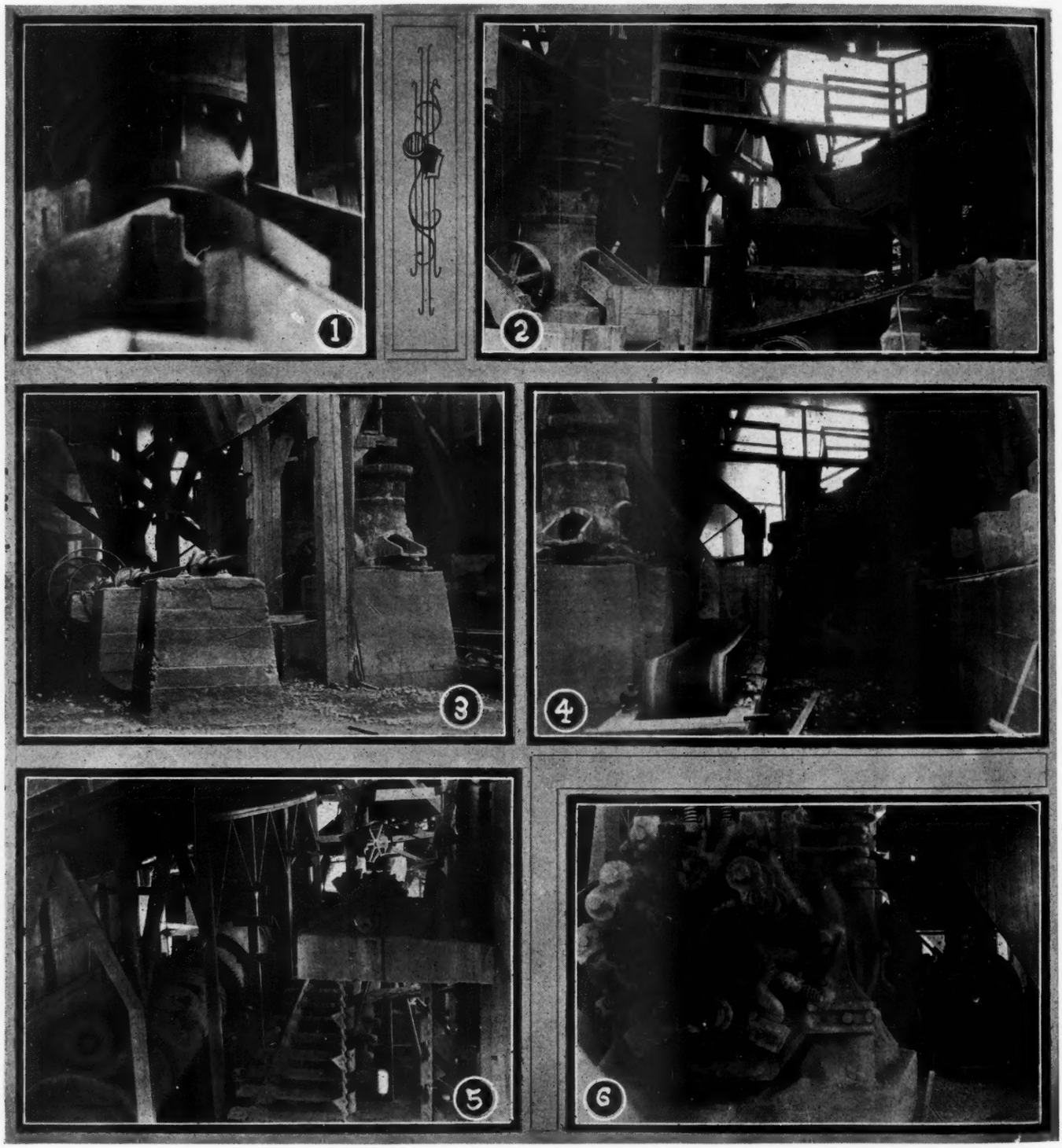
pushed the timber frames out of place. It is now proposed to roof over these divisions and add other cross-bracing, thus converting the compartments into covered bins for the storage of agricultural limestone dust.

The dust and fine stone (or any crushed stone product if desired) are chuted from the sizing screens to a rotary dryer, and thence elevated to the feed spouts of ring-roll mills (Sturdevant). The mill output is screened through vibrating screens, which in addition to separating out the dust, are provided with an extra screen surface above the dust screen for removing ½ to ¼-in. screenings. These go to a bin where they can be shipped out as clean dry screenings, or they can be fed back into the mill.

The agricultural limestone dust is loaded out of the bins by gravity into box cars, as shown in one of the views. All sales are made in bulk.

At the time the editor visited the plant in March a stone-washing scrubber and screen were being installed in the space between the stone-screening house and the agricultural lime plant, making this one of the very few washed-stone plants in the country.

L. J. Backus, Cartersville, Ga., is the general manager and operating head of the company.



1—Initial crusher; 2—Re-crusher; 3—Rejection crushers; 4—Conveyor; 5—Dryer; 6—Pulverizer

Work Being Rushed on Newest Michigan Cement Plant

Petoskey Portland Cement Co. Expects Big Business in Both Crushed Stone and Cement

WORK IS PROGRESSING rapidly on the new crushing plant of the Petoskey Portland Cement Co., Petoskey, Mich. In a few months work will be well under way on the new cement mill. The quarry and crushing plant include what was formerly the property of the Petoskey Crushed Stone Co.

This property consists of 377 acres of high calcium limestone, varying from 50 to 110 ft. thick above the level of Lake Michigan, and the deposit extends from 300 to 500 ft. below water level. There is estimated to be 50,000,000 tons of stone above water level. The other property of the company consists of 23 acres of shale land.

These materials have been used in the manufacture of Portland cement for a number of years. Since the exhaustion of its marl deposits the Newago Portland Cement Co., 190 miles to the south of Petoskey, has derived all its raw materials from the Petoskey Crushed Stone Co., as it will continue to do in the future.

The Petoskey Portland Cement Co. was organized two years ago. The president is Albert B. Klise, also president of the Blackmer Rotary Pump Co., the A. B. Klise Lumber Co., and the L. N. Overholt Co. He is also mayor of Petoskey. His fortune was made in the lumber business and for many years he has been one of the most prominent lumbermen of the state.

Homer Sly, for the past ten years managing director of the Petoskey Crushed Stone Co., is a vice-president. He has had many years' experience in the manufacture of cement and lime. Under his management orders of 1,000,000 tons of crushed stone a year have been offered the company.

The other vice-president, who has charge of design and construction, is J. C. Buckbee, of the J. C. Buckbee Engineering Co., Chicago. Mr. Buckbee is already interested in several crushed stone enterprises and is the head of the Northern Gravel Co., Barton, Wis.

At present most of the energies of the new company are being directed to the enlargement of the crushing plant to a capacity of 3,000 tons per day, and the completion of a dock on Little Traverse Bay, from which shipments can be made to any of the lake ports.

The capital stock of the new cement company is $1,500,000, all of it common. The par value is $10 per share.

Cement Prices Before, During and Since the War

WASHINGTON, D. C.—How cement prices in this country fluctuated during the war and how those fluctuations compared with price changes in the United Kingdom is one of the subjects discussed in a "History of Prices During the War", which has just been published by the Department of Commerce in cooperation with the War Industries Board.

In the report, a brief summary of the activities of prices during the war is given, the survey covering the six years from 1913 to 1918, inclusive. Immediately after the outbreak of the war, it is declared, the general price level jumped up four points, held that level for two months, and then fell back almost to the level of July, 1914. This flurry was caused mainly by a speculative advance and relapse in the prices of sugar, grains and hard fibers, which carried other commodities with them.

The sustained rise of prices did not begin in the United States until the autumn of 1915, more than a year after the war began in Europe, although from March to November of that year, inclusive, cement prices were somewhat below normal. "Once started, however, the (general) rise was extraordinarily rapid. By August, 1916, prices stood 25 per cent above the pre-war level; by February, 1917, 50 per cent; by May, 1917, 75; and by September, 1918, 100 per cent.

"The periods of most rapid rise came in the winter of 1915-16, when European war orders began to have a pronounced effect upon American business; the autumn of 1916, when steel prices shot up at an extraordinary rate; and, above all, the spring of 1917, when the United States entered the war.

"The last and greatest advance was cut short after July, 1917, and for a full year the price level was kept fairly stable. Business conditions and the huge war orders which the Government was placing favored a further advance of prices. It is difficult to explain the checking of the rise on any other ground than the substantial success of the Government's efforts to control prices through the Food and Fuel Administrations, the purchasing bureaus of the War and Navy Departments, and the price-fixing committee of the War Industries Board. The price level began to move up again, though much more slowly than before, in the last half of 1918.

"The end of the fighting in November did not produce an immediate recession of the price level as a whole. Though many individual commodities declined, the index number of 'all commodities' advanced in December to 203, the highest point attached in the six years covered." This represents an advance all along the line, during the six-year period, of 103 per cent.

Foreign Markets for Cement

OPPORTUNITIES for American cement manufacturers to do business in the Orient are given in No. 129 of the "Commerce Reports," issued by the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C. The countries reported upon are Australia, China, and India. Japanese cement manufacturers have very largely increased their trade in these markets since the war. The principal opportunity for American manufacturers appears to be for white cement, which is not made in the Far East.

A Vanishing Industry

EIGHT YEARS AGO nearly one-third of the cement made in Canada was derived from marl. Today the amount of marl cement made in the dominion is insignificant. See accompanying table.

Cement made from Marl and from Limestone.

Year.	Cement from Marl.		Cement from Limestone.	
	Quantity.	Per cent	Quantity.	Per cent
1911	1,626,857	28·0	*4,050,682	72·0
1912	1,420,155	20·0	*5,720,849	80·0
1913	1,491,131	16·8	*7,395,202	83·2
1914	641,869	7·3	*8,085,400	92·7
1915	429,268	8·3	4,724,495	91·7
1916	164,436	3·4	4,588,597	96·6
1917	96,755	1·9	4,890,500	98·1

*Includes slag cement.

City Building Codes Criticized

Virgil G. Marani, Chief Engineer of Gypsum Industries Associations, Tells Weaknesses of Nearly All Codes

BUILDING SUPPLY DEALERS, according to Virgil G. Marani, chief engineer of the Gypsum Industries Association, Chicago, ought to take a more active interest in getting building codes properly revised. Mr. Marani was addressing a district meeting of the Indiana Builders' Supply Association, when he made this statement, but it applies with equal force to producers of building materials.

Mr. Marani's criticism of municipal building codes was as follows:

"The loss by fire in the United States each year is about one-half of the cost of all the new construction for that year. This is not entirely due to the prevalent use of wood in construction. The rapid development of our cities, the somewhat temporary nature of many buildings, the migratory tendencies of many people, and other necessary economies are all factors that in the end make the use of lumber for building purposes not only desirable but often advisable. By proper precautions and the wise use of incombustible protective materials, constructions of wood can be made reasonably fire-resisting.

"There is sufficient information at hand, from existing codes, and the inadequacy of most of them, to enable a diagnosis about as follows:

"(1) The writers of Building Codes are in many cases not informed upon the construction and use of many materials for which they frame governing laws.

"(2) Often (only too often) Commissioners appointed to frame building laws are politically appointed, politically controlled, and naturally under the influence of many inexplicable political ramifications.

"(3) 'Appeal Boards' are usually under the same disadvantages, though they should also be entirely out of politics and should be appointed from a list of names submitted by the local organizations representing the Architectural, Engineering, Builders and Real Estate interests of the community.

"(4) Building Codes are too voluminous; they should cover only such requirements as are the 'minimum' possible for safety and health. A small code all enforced, alike to everyone, is better than a voluminous code from 25 to 50 per cent enforced.

"(5) In the allowable use of materials for all types of construction and for 'fireproofing,' such materials should be placed on a merit basis, i. e., should be required to conform to certain specified strength and fire resistive requirements.

"If materials are mentioned by name (as is usually done), the 'maximum' kind and nature of materials which can be used should be allowed, instead of mentioning a few favored products, and admitting others, or not, as the case may be, under the vague, uncertain, and much used term **'or other approved** materials and construction.'

"(6) Contrary to present tendencies, the more general construction of fireproof buildings should be encouraged by admitting the greater use of many types of construction and materials, which now are allowed in many codes under certain penalties and restrictions. In many portions of 'fireproof' buildings **incombustible** materials serve the purpose as well as so-called **fireproof** materials, and are cheaper.

"(7) Since 99 per cent of the buildings built per year in the states are not fireproof, building codes should give more attention to the proper construction of this type of structure. At present practically 75 per cent of any code governs the construction and materials entering into **fireproof construction.**

"(8) Buildings should be classified according to the degree of protection of their construction against the action of fire, which might be somewhat as follows:

" 'Full protection signifying what we know as fireproof.'

" 'Partial protection signifying what we know as semi-fireproof.'

" 'Temporary protection signifying what we know as slow burning, and applying particularly to the frame structure properly designed and protected.'

"There is no reason for unnecessary delay or expense in the writing of building codes because practically all the information needed regarding use and strength of materials can be obtained from any of the national organizations interested in these lines of activity."

Relation of 'Americanization to Safety in Industry

By John A. Oartel
Carnegie Steel Co., Pittsburgh

I SOMETIMES WONDER if we Americans, who have been accustomed to our environment all our lives can appreciate the mental attitude of the foreign-born workman in our industries. The man from any of the countries of southern Europe has been transported within a few weeks from the quiet life of a country village, where the hazard to life and limb is unknown, to the busy life of the mill or factory. Shifting locomotives, molten metal, and moving machinery confront him at every turn. Is there any wonder he sometimes becomes confused and pays the price with his life or limb?

We as Americans are becoming awakened to the fact that it is not right that 30,000 lives should be sacrificed annually and 100,000 maimed workmen should be the by-product of American industry. The words trade risk will no more suffice as a reason for the taking of a life. We are looking to you who are fostering this Americanism project to furnish us the means by which we can get the message of safety to our workmen. With the understanding of our language and an appreciation of our ideals, he will be led and taught to observe that personal thoughtfulness and carefulness of his own safety which we feel is the only thing lacking today.

Lime Mortar For Chimneys

"OUR SURVEY OF BUILDING CODES," says a statement by Robert F. Hall, general manager, the Lime Association, "shows that some of them bar the use of lime products for mortar for building brick chimneys, the reason, as set forth by the codes, being that lime disintegrates in time, due to its inability to resist the action of heat and flue gases, and is liable to fall out of the joints, thus producing a hole through which fire is likely to penetrate. For this reason lime is specifically barred from use in cement mortars.

"In running this matter down to a conclusion, it has been learned that the large factory chimney constructors of the country specify and use a mortar composed of one part cement, two parts lime and five parts sand, it being their opinion, based upon many years of experience, that a chimney built with this mortar exhibits a decidedly less tendency to crack than when any other kind of mortar is used. In addition to this, they have found lime to be a better resister of heat. This information is given to members with a statement also that we are working up a good case against offenses to lime in building codes and we believe as soon as we have compiled our data further we shall be able to have such building code clauses eliminated."

Construction Business Has Passed Over Roughest Part of Journey

Evidence of the Steady Climb to Good Building Era Multiplies—Membership of Cement Makers' Export Organization—Prices of Lime and Cement—Bankers Lending More Freely

NEW YORK—Reconstruction progress in the building industries is passing out of the vale of insignificant interference and into a plane of big business policies, according to the Dow Service Daily Building Reports.

Notable among the evidences of strong hands in the molding processes is the completion of an organization of Portland cement manufacturers with an aggregate annual output of 14,000,000 bbls. of cement a year to cater to the fast developing export business, the completion of the sale and merger of the country's biggest wire cloth manufacturers, action by the local building material dealers in readjusting lime prices to the Ohio base, a conference on the plumbers' earthenware situation to meet new wage contingencies, the sharp change for the better in steel outlook and a general feeling in the market that the roughest part of the road to a moderate sized building era has been passed.

Slight declines in the price of hydrate finishing lime in cloth bring the delivered price in New York and Bronx to $22.60 and to $20.60 per ton in paper bags, with usual rebates for empty bags. Hydrate common lime prices effective this week put the price at $22.50 for material in cloth and $18.50 for material in paper bags. This price change puts the eastern market on a price plane with Ohio lists and makes for greater stability and convenience of builders doing inter-state business.

Further indication of the future tightness of building material supply for domestic use is shown in the fact that ten Portland Cement manufacturers, having an aggregate productive capacity of 14,000,000 barrels a year have organized the Cement Export Co. under the incorporation laws of the state of Delaware, with the principle office in New York. All eastern cement companies have been invited to join the organization. The directors are Emil Loeb, Coplay Cement Manufacturing Co.; Frank H. Smith, Lawrence Cement Co.; Joseph Brobston, Dexter Portland Cement Co.; J. A. Horner, Nazareth Cement Co.; L. C. Horton, Phoenix Cement Co.; J. W. Fuller, Allentown Portland Cement Co.; Charles F. Conn, Giant Portland Cement Co.; Morris Kind, Hercules Cement Corporation, and F. W. Kelly, Helderburg Cement Co. The plan involves having in storage here at all times large quantities of cement with a cooperage plant to meet demands for American cement all over the world.

Despite labor difficulties of a more or less desultory nature, the building situation is shaping itself for big things in most of the big building centers east of the Ohio. Reconstruction disturbances have been much less than financiers had expected that they would be following the signing of the armistice and building money is unquestionably freer in tone today. The feeling is now fairly general that the season is rather too far advanced for anything like a normal building movement this year, regardless of the volume of money for building loans that is made available because most building material manufacturers have underestimated, rather than overestimated the 1919 building season's requirements and labor scarcity has further discounted these estimates as represented by volume of finished materials ready for shipment to this market. Portland cement prices probably will move up after September.

High Quality Road Material Discovered in Hunt County, Texas

GREENVILLE, TEXAS—Recent investigation in this county has brought to light what is said to be one of the best qualities of road building material to be found in the state. The rock is said to be very hard limestone and is found in great quantities on Sabine River, four miles west of Lone Oak, in the southern portion of Hunt county. A report on the quality of the material was recently made to Judge A. J. Gates of the Commissioners' Court and chairman of the Hunt County Road Board following an analysis made at the University of Texas. The report is said to be most favorable.

A test is now being made to determine the extent of the ledge, and if found to be of sufficient quantity, the rock will be crushed and used in the construction of Hunt county's system of roads, bonds for which to the amount of $2,000,000 were voted March 22. The property on which this rock is found parallels Sabine River for several miles and is owned by individuals.

General Crushed Stone Co.'s New England Plant

A NINTH PLANT has just been added to the group of crushed-stone plants owned and operated by the General Crushed Stone Co., Easton, Pa., of which John Rice, vice-president of the National Crushed Stone Association, is president.

The new plant is eight miles northwest of Boston, Mass., on the Boston & Maine R. R. It has been operated under the name of the Winchester Rock & Brick Corporation. The transfer was completed June 1.

The property includes a fine quarry with a practically unlimited quantity of trap rock. The plant has a present capacity of about 1,000 tons per 10-hour day. It is electrically operated and the crushing equipment consists of one No. 8 and two No. 6 gyratory crushers (Gates) and one Sturtevant roll.

A large part of this plant's output will be shipped by motor truck for state highway work in the immediate vicinity and to neighboring towns and cities.

This makes the ninth plant of the company. The other eight are at Akron, North Le Roy and Little Falls, N. Y., and Wilkes-Barre, White Haven, Redington, Rockhill and Glen Mills, Pa.

Magnesite Quarries Closed Because Embargo Was Lifted

SPOKANE, WASH.—The fate of a $2,000,000 investment employing 100 men in this district is undecided as the result of the lifting of the embargo on magnesite imports from Austria, says a newspaper. The quarries at Valley, Wash., which contributed largely to the American supply of magnesite following the suspension of the foreign supply, have been closed down pending developments.

It is stated that Austrian magnesite can be delivered to eastern steel manufacturers for less than the freight charged on the western American product.

Potash Producers' Association Establishes Headquarters In Washington

THE UNITED STATES Potash Producers' Association has completed its organization by the appointment of Frederick W. Brown, as executive secretary, with headquarters at Washington. Mr. Brown has been associated with the Department of Agriculture as chief of the fertilizer investigation, of the Bureau of Soils. His work has brought him in touch with the fertilizer industry, among whom he has many friends.

NEW MACHINERY AND EQUIPMENT

Gasoline Locomotives

FOR SEVERAL YEARS now the Baldwin Locomotive Works, Philadelphia, have been manufacturing gasoline dinky locomotives, as well as the standard steam locomotives, which, of course, are known the world over.

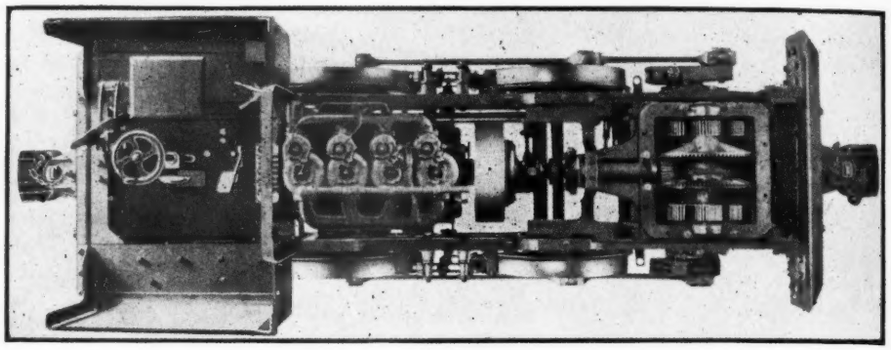
Some details of this company's latest improvements in gasoline locomotives are given herewith. These locomotives are made in five standard sizes—3½-ton, 5-ton, 7-ton, 9-ton and 23-ton.

The accompanying plan view shows a locomotive with radiator, superstructure and top of transmission case removed, showing the arrangement of parts and the application of power from the engine to all four driving wheels.

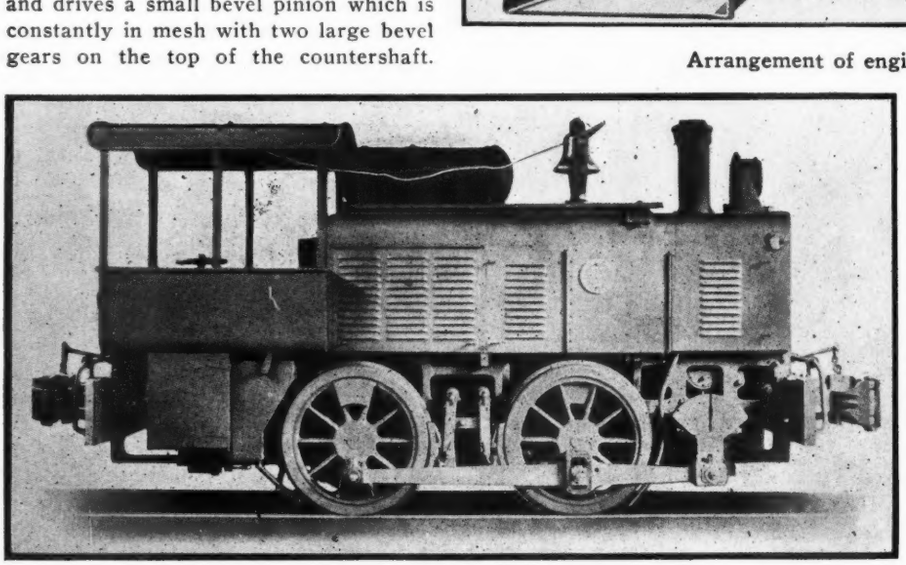
The four-cylinder engine is vertical and drives a small bevel pinion which is constantly in mesh with two large bevel gears on the top of the countershaft. With the engine fly-wheel friction-clutch engaged, the large bevels run in opposite directions.

These bevels run loose on the intermediate shaft except when one or the other is engaged by a forward and reverse jaw clutch located midway between the bevel gears.

Two spur gears of different diameters are keyed fast to the drop countershaft, and these gears are constantly in mesh with corresponding high and low speed gears located on the jack or driving shaft, directly under the top countershaft. The two jack-shaft gears run loose, except when one or the other is engaged by either a high or low speed jaw clutch located centrally on the jack shaft. On the ends of this same jack shaft there are two driving cranks set 90 deg. apart and connected to both pairs of driving wheels by patented side rods of special design. With this construction only a single rod is used on each side, and the width over-all and the overhang at the front end of the locomotive can be kept down to a minimum. This method of drive is entirely positive, and corresponds, as far as is practicable, with that found in the most successful steam locomotives. It allows free vertical motion for the driving wheels and complete spring suspension of the entire locomotive.



Arrangement of engine and driving gears

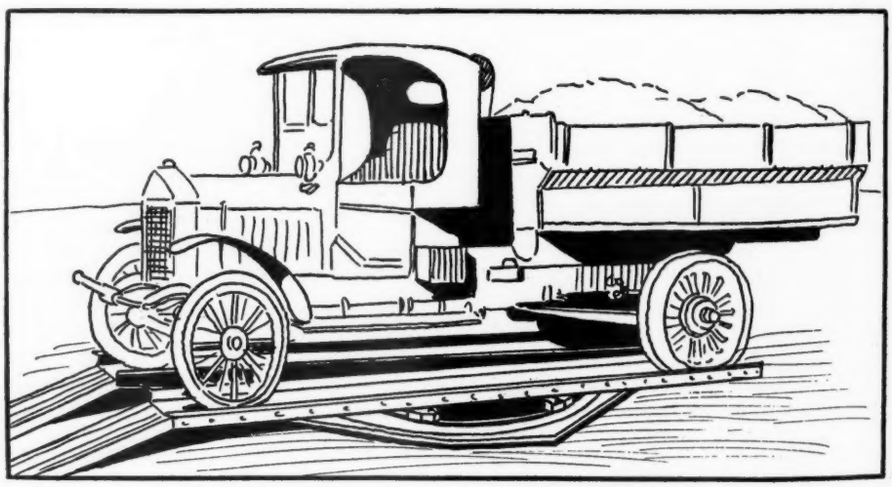


Baldwin gasoline locomotive for quarry service

Portable Turntable for Motor Trucks

THE McKIERMAN-TERRY DRILL CO., New York City, has recently put on the market a portable turn-table for motor trucks, which undoubtedly will prove useful at the yards and plants of producers of mineral aggregates.

This turn-table is so constructed as to permit of its being pulled along by a motor truck, steam shovel or crane without damage to the machinery or without tearing up the ground under it. It is made in sections, to facilitate hauling it to another part of the yard, and is easily and quickly assembled, according to the manufacturer. It is furnished for either hand or power operation.



Portable turntable for motor trucks in yards, etc.

General News From the Rock Products Markets

Rail Rate Making Practices Subject of Inquiry by Senate Committee

SOME RULE of law governing the present application of the long and short haul clause of the interstate commerce act is necessary, the senate interstate commerce committee was told June 17 by Interstate Commerce Commissioner Clark, says a newspaper dispatch from Washington, D. C.

"The commission's task at present requires it to deal with conflicting interests of communities when those interests are completely irreconcilable," he said. "The present act lays down no rule of law which can be followed."

Commercial competition, not the cost of service, underlies rate making, Mr. Clark said.

"That's the reason most of the railroads in the country are 'busted' today, isn't it?" asked Senator Robinson of Arkansas.

"It has had a great deal to do with bringing about their financial difficulties," Mr. Clark responded. "Traffic has been built up without any consideration for the return or lack of return which its creation has brought the roads."

Power to prescribe minimum rates, and to control water as well as rail carriers, would assist the commission, Mr. Clark said, adding that the commission's rate policy had been based partially on the theory that healthy competition between rail and water carriers was to the best interests of the country.

Railroad Administration Tells How Contractors Get Freight Reduction

IN RESPONSE to a request by E. Guy Sutton, secretary of the National Association of Sand and Gravel Producers, the Railroad Administration gave the following information in regard to the application of the 10c per ton reduction on mineral aggregates used in road work;

"Please refer to Traffic Circular No. 9 and Accounting Circular No. 90, issued by the Railroad Administration, with respect to the reduction in rate on certain road building materials consigned to state or municipal governments.

"New regulations No. 49, issued by the Commissioner of Internal Revenue, provide that the transportation charges may be paid by the shipper or by contractor, and be exempt from war tax if proper exemption certificates are signed by a government officer, or employe, indicating that the charges are paid in behalf of the government. This provision is contained in Article No. 80, Regulations No. 49, which I am quoting below for your information.

" 'Prepaid charges—Where transportation charges, either prepaid or collect, are paid by the shipper at origin of the shipment, or by a contractor at destination of the shipment, upon property shipped to the United States Government or to a State or Territory or the District of Columbia, or to a Government contractor, and the payment of such charges is in behalf of the Government, and the amount paid therefor is borne by the Government, such amounts are not subject to the tax. Exemption certificates properly signed by a governmental officer or employe must be furnished to the carrier as evidence of such rights to exemption.'

"We have talked with representative of the Traffic Department concerning the matter, and he indicates that there will be no objection to applying the reduced rate in accordance with this provision."

CHAS. A. PROUTY,

Director of Division of Accounting.
Washington, D. C., June 11, 1919.

Government Investigating Protection of Potash Industry

WASHINGTON, D. C.—Representatives of the potash industry, the bureau of mines and the geological survey appeared recently before the house committee on ways and means to urge a protective tariff on potash, at least until this industry has become firmly established.

Myron M. Parker, attorney for the United States Potash Producers' Association, told the committee that the great investment in the industry is threatened unless some protection can be afforded to keep out German competiton. "There is fifty million dollars invested in this industry," he declared, and unless something is done immeditaely the entire industry will be dissolved and thousands of employes thrown out of work. Furthermore, the country will be dependent again upon foreign countries, as it was before the war."

A. G. White, a representative of the bureau of mines, also urged that protection be given the industry, at least for five years. We are now able to produce about one-half of the potash needed by this country, he declared, but the cost is about 25 per cent higher than the foreign product. Within five years, however, potash can be produced in this country as cheaply as in any foreign country and in sufficient quantities to supply all demands.

Potash was the first industry to be taken up for consideration by the ways and means committee, which inaugurates its work of changing the tariff. General hearings will probably be held on the question of tariff in July, and are expected to be lengthy proceedings. Every effort, however, will be made to enact a new protective tariff law before the foreign nations are in position to enter the markets of this country in competiton with domestic manufacturers.

Boost Roadbuilding with Slogan Cuts

GOOD Roads Associations and persons interested in promoting the construction of permanent highways may have slogan cuts like the one shown here upon request to the Portland Cement Association, 111 West Washington Street, Chicago.

Campaign cuts of this character are easily inserted in local advertising, and are welcomed by advertisers who are in favor of better roads. The use of such cuts will aid in keeping the subject before the reader's eye.

Merom (Ind.) Gravel Co. Opens New Pit

INDIANAPOLIS, IND.—The Merom Gravel Co., of Riverton, Ind., has opened a new pit near Merom, according to a newspaper dispatch, and is extending its sales territory. The company has its eye on the Illinois market where road construction work is beginning to make big demands for gravel.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Auburn and Syracuse, N. Y.	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.	Railroad ballast, 1.00					
Burlington, Vt.	1.25		$1.00 per ton, all sizes 3.00	1.75	1.75	
Coldwater, N. Y.	All sizes 1.50					
Coldwater, N. Y.	Flux, 1.50@2.10					
Lime Kiln, Md.	1.00	2.00	1.85	1.65	1.45	1.25
North Leroy and Akron, N. Y.	$1.00 for all sizes, including R. R. ballast					
CENTRAL:						
Alden, Ia.	.40		1.00	1.00	1.00	
Alton, Ill.	1.85		1.45	1.35		
Belvidere, Ill.	1.00 for any size produced					
Bettendorf, Ia.	1.25	1.25	1.25	1.25	1.25	(2300 lbs)
Dundas, Ont.	.65	1.05	1.05	1.05	.85	.85
Eden and Knowles, Wis.		80	1.00	1.00	1.00	
Elmhurst, Ill.	(¼-in. 1.25)		1.00 (Sc'gs .85)		.85	.85
Grass, Mich.	1.00, all sizes					
Greencastle, Ind.	.90	1.10	1.00	.90	.90	.90
Illinois, Southern	1.50	1.25	1.25	1.25	1.10	
Lannon, Wis.	1.00 all sizes					
Lewisburg, O.	.80@1.00		1.00@1.10	1.00@1.10	1.00	1.00
Lima, O.	1.10 for any size					
Linwood, Ia.	.60	1.05	1.00	.91	.91	1.00
Mankato, Minn.			(1-in. 1.50)	(2-in. 1.25)		
Mayville, Wis.	.75	1.00	1.00	1.00	1.00	1.00
Oshkosh, Wis.	1.00 in all sizes, Blue Limestone					
River Rouge, Mich.	.80@1.15	1.15	1.15	1.15	1.15	1.15
Sheboygan, Wis.	1.00 for all sizes					
Stone City, Ia.	.50		(1-in. 1.40)	1.30	1.20	
Toronto, Can.	1.55	1.95	1.95	1.95	1.75	1.75
	These prices include 90c freight					
SOUTHERN:						
Brooksville, Fla.	1.00			2.50		
Cartersville, Ga.		1.80	1.85	1.75		1.65
Fort Springs, W. Va.	1.00	1.20	1.40	1.60	1.40	
Hopkinsville, Ky.	1.10			1.00	1.00	
Linnville Falls, N. C.	All sizes, 1.35					
	Railway ballast 1.10 per cu. yd.					
Mascot, Tenn.			1.00 (Chatts)			
Memphis Junction, Ky.	Average 1.10					
Winnfield, La.	.60		1.60	1.60	1.60	
WESTERN:						
Atchison, Kans.	.50	1.80	1.80	1.80	1.70	1.70
	Rip-Rap, 1.30					
Blue Springs & Wymore, Neb.	.15	1.45	1.45	1.35@1.40	1.25@1.30	1.20
Dittlinger, Tex.			1.20	1.00	.90	
El Paso, Tex.	.90 for all sizes					
Kansas City, Mo.	.60	1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Bernardsville, N. J.—Trap		2.40*	2.40*	(1¼ in. and less, 2.20*)		
	Bronze, top of quarry, 1.50*					
Birdsboro, Pa.—Trap	2.00	1.80	1.70	1.50	1.50	1.25
Branford, Conn.—Trap	.80	1.25	1.25	1.10	1.00	
Castro Pt., Richm'd, Cal.—Trap	.50*		1.40*	1.30*	1.20*	
Dresser Jct., Wis.	.50	1.25	1.25	1.10	1.00	.95
Duluth, Minn.	.50@ .65	1.40@1.50	1.25@1.35	1.10@1.15	1.10@1.15	1.00
Farmington, Conn.—Trap	.80	.95	.95	.90		
Glen Mills, Pa.—Trap	1.00	1.40	1.70	1.55	1.40	1.40‖
Millington, N. J.—Trap	1.80	2.00	1.80	1.60		
New Britain, Conn.—Trap	.80	1.30	1.25	1.25	1.10	
Rock Hill, Pa.—Trap	1.00	1.35	1.70	1.55	1.35	1.35‖
Westfield, Mass.—Trap	.60	1.10	1.10	1.00	.90	

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Atlanta, Ga.—Granite	1.60		2.85	2.35	2.35	
Brooksville, Fla.—Flint	1.00			2.50		
Fair Oaks, Calif.—Cr. Bldrs.	.85	1.05	.95	.85	.85	
Hendlers, Pa.—Quartzite	.80	1.00	1.25	1.00	1.00	1.00‖
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.20‖
Middlebrook, Mo.—Granite	3.50		1.75	1.75		1.00‡
	Crusher run, 2-in. down to dust, 2.00					
Oroville, Calif.—Cr. Cobbles	.85	1.05	.95	.85	.85	
So. Richmond, Va.—Granite	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
White Haven, Pa.—Sandstone	.85	1.20	1.40	1.20	1.20	1.20‖

*Cubic yard. †Agrl. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Coldwater, near Rochester, N. Y.—Analysis: $CaCo_3$, 56.77%; $MgCo_3$, 41.74%—80% thru 100 mesh; ppr., 4.50; bulk 3.00

Hillsville, Pa.—Analysis, $CaCo_3$, 85%; $MgCo_3$, 1½%—(70% thru 100 mesh) in 80 lb. ppr. bags, 4.25; bulk..... 2.75

Jamesville, N. Y.—68% thru 100 mesh; 95% thru 50; 100% thru 20. Sacks, 3.75; bulk..... 2.25

Lime Kiln, Md.—50% thru 50 mesh; bulk 4.00

Pownal, Vt.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk 2.75

West Stockbridge, Mass. — Analysis: $CaCo_3$, 95 to 98½%—33% thru 200 mesh; 66% thru 100; 100% thru 40. Bulk 2.85
In cloth bags, 3.10. Bag charge, 10c, returnable.

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, $CaCo_3$, 96%; $MgCo_3$, .75%..... 2.00

Bedford, Ind.—(90% thru 10 mesh) Analysis, $CaCo_3$, 98.5%; $MgCo_3$, 0.5% 1.75

Canton, O.—100% thru 10 mesh; 49% thru 100; 59% thru 50..... 3.00

Columbia, Ill., near East St. Louis —(⅛" down) ..... 1.25@1.80

Elmhurst, Ill. — (Analysis, $CaCo_3$, 35.73%; $MgCo_3$, 20.69%) 50% thru 50 mesh 1.25

Greencastle, Ind.—(Analysis, $CaCo_3$, 98%) 50% thru 50 mesh..... 1.75

Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100..... 2.75@3.00

Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, $CaCo_3$; 44%, $MgCo_3$ 2.00

Marble Cliff, O.—(50% thru 100 mesh) Analysis, $CaCo_3$, 86%; $MgCo_3$, 8%.... 3.00

Marblehead, O. — (Analysis: $CaCo_3$, 95.33%) 50% thru 100 mesh..... 3.00@4.50

Milltown, Ind.—Analysis, $CaCo_3$, 98% 1.50

Montrose, Ia.—(90% thru 100 mesh).. 1.25@1.35

Muskegon, Mich.—(90% thru 50 mesh) Analysis, $CaCo_3$, 53.35%; $MgCo_3$, 43.27% 2.50

Piqua, O.—Analysis: $CaCo_3$, 32.8%; $MgCo_3$, 3.2%; neutralizing power in terms of calcium carbonate, 95.3%—70% thru 100 mesh, bulk..... 2.50@4.00

Rockford, Ill. — Analysis, $CaCo_3$, 53.75%; $MgCo_3$, 44.35%..... 1.25

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛" mesh) Analysis, $CaCo_3$, 89.61 to 89.91%; $MgCo_3$, 3.82% 1.50

Stone City, Ia.—(50% thru 100 mesh) Analysis, $CaCo_3$, 98%..... .50

Toledo, O.—Analysis, $CaCo_3$, 52.72%; $MgCo_3$, 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen)..... 1.80

Whitehill, Ill. — Analysis, $CaCo_3$, 96.12%; $MgCo_3$, 2.50%—
50% thru 100 mesh, bulk..... 1.50
90% thru 100 mesh..... 5.00

SOUTHERN:

Dittlinger, Tex. — Analysis, $CaCo_3$, 99.09%; $MgCo_3$, 40%.
90% thru 100 mesh..... 2.00
90% thru 4 mesh..... 1.00

Fletcher, N. C.—Analysis, $CaCo_3$, 75%; $MgCo_3$, 22%—(all thru 10 mesh; 50% thru 100 mesh)—100 lb. paper or 200 lb. burlap, $3.60; bulk..... 2.10

Grovania, Ga.—Analysis, $CaCo_3$, 95%; $MgCo_3$, none—50% thru 100 mesh.... 2.50

(Continued on next page.)

Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Hopkinsville, Ky.—Analysis, 94.6 to 98.1% $CaCo_3$—Bulk	2.00
Memphis Jct., Ky.—(Analysis, $CaCo_3$, 95.31%; $MgCo_3$, 1.12%) average price	2.00
Keystone, Ala.—(90% thru 50 mesh) Analysis, $CaCo_3$, 99.50%; $MgCo_3$, none	1.25
Ladds, Ga.—Analysis: 96 to 98% combined carbonates—All thru 10 mesh with all dust in	2.50
Mascot, Tenn.—Analysis, $CaCo_3$, 52%; $MgCo_3$, 38%.	
(80% thru 100 mesh)	2.50
(80% thru 200 mesh)	3.50
(All thru 10 mesh)	2.00
Paper bags $1.50 extra per ton; burlap, 2.00 extra per ton.	
Tyrone, Ky.—Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%—90% thru 4 mesh	1.50@1.75
Winnfield, La.—(50% thru 50 mesh)	4.50
WESTERN:	
Cement, Cal.—Analysis, $CaCo_3$, 95%; $MgCo_3$, 1% (50% thru 100 mesh)	4.00@5.00
Fresno, Calif.—(Analysis, $CaCo_3$, .94%; MgCo, .02%) 50% thru 200 mesh; 90% thru 100; 100% thru 40. Prices for delivery: Sacks, 6.50; bulk Sacks, 10c each.	6.00
Kansas City, Mo.—(50% thru 50 mesh)	1.10

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:	
Bowmanstown, Pa.—Glass sand	2.50
Gray Summit, Mo.—Glass	2.00@2.50
Hancock, Md.—Engine and glass	2.50@3.00
Klondike and Pacific, Mo.—Glass:	
Contracts	2.00
Carlots	2.50
Mapleton, Pa.—Glass, dry	2.75@3.00
Massillon, Ohio—Glass	3.00
Michigan City, Ind.—Glass sand	.30
Millington, Ill.—Glass	1.75@2.00
Mineral Ridge, O.—Glass	2.75
Montoursville, Pa.—Glass, green, washed	2.00@2.75
Ottawa, Ill.—Glass	2.00
Large contracts	1.75
All others	2.00
Sands, Elk Co., Pa.—Glass sand:	
Selected, green	2.50
Thayer, W. Va.—Glass	2.75
FOUNDRY SAND:	
Albany, N. Y., District—Core	1.25@2.00
Furnace lining	2.25@2.50
Molding, fine and coarse	1.65@1.85
Sand blast sand	1.75@3.50
Brass molding	1.65@1.85
Allentown, Pa.—Core: molding fine	1.25@1.40
Arenzville, Ill.—Molding fine	1.50
Bowmanstown, Pa.—Core	1.20
Molding, fine and coarse	1.50
Roofing pebble, washed	5.00
Cleveland, O.—Core, on car	1.00@1.25
Molding fine, on car	1.75@2.25
Molding coarse, on car	1.50@2.25
Brass molding, on car	1.25@2.00
Delaware, N. J.—Molding	1.50@2.00
Franklin, Pa.—Core, traction and brass molding	2.00
Molding, fine	2.00
Molding, coarse	1.50@1.75
Gray Summit, Klondike and Pacific, Mo.—Molding, stone sawing and traction sand, contract, 1.50; carlots	2.00
Greenville, Ill.—Molding coarse red	1.60
Hancock, Md.—Core and brass mldg.	1.65
Hellam, Pa.—Core	2.00
Kansas City, Mo.—Missouri River core	.75
Leesburg, Pa.—Core, furnace lining, molding fine and coarse, traction, brass molding	2.00
Mapleton, Pa.—Molding, fine and core, damp	2.50
Molding, fine, dry	3.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.60	.60	.60	.75	.75	.75
Boston, Mass. (wharves)	1.25	1.00	2.50	1.75	1.65	1.50
Buffalo, N. Y. (Niagara River)	.80	.80	.75	.75	.75	.75
Farmingdale, N. J.		.43	1.75		1.35	
Morristown, N. J.	.60	.60	1.20	1.00	1.00	1.00
North Wilbraham, Mass.		.60*	2.00*		1.25*	
Shaw's Land'g, Meadville, Pa.		1.00				1.00
Washington, D. C.—Wharves	.75	.75	2.00	1.40	1.20	1.20
CENTRAL:						
Anson, Chippewa Co., Wis.		.50	.95	.95	.85	.85
Barton, Wis.	.75	.70	1.00	.70	.70	.70
Beloit, Wis.		.50	.60	.60	.60	
Chicago	1.25@1.40*	1.25@1.40*	1.25@1.65*	1.25@1.65*	1.25@1.65*	1.25@1.65*
Chicago prices, F. O. B. cars initial railroad line. At pits, Chicago district, .27*@.75*						
Cincinnati & Miami Grove, O.	.60@ .80	.55@ .75		.55@ .75	.55@ .75	
Columbus, O.	.65	.65	.60	.70	.70	.65
Des Moines, Ia.	50@1.00	.50	1.50	1.50	1.25	1.25
Drake, Mo.	.65	1.15	⅝, .90	.70		.65
Earlestead, near Flint, Mich.	.55@ .60	.55@ .60		.75@ .85	.75@ .85	.75@ .85
Escanaba, Mich.		.90	1.60	1.20	1.00	.90
Fort Dodge, Ia.	1.10	1.00	1.80	1.80	1.80	1.80
Fort Jefferson and Mechanicsburg, O.	.40@ .60	.40@ .60	.40@ .60	.50@ .70	.50@ .70	.50@ .70
Grand Rapids, Mich.		.40		.80	.67	.67
Hersey, Mich.	.50	.50		1.00	1.00	.75
Illinois, Northern Points	.60	.60@ .70	.70	.70	.60@ .70	.50@ .60
Indianapolis, Ind.	.50	.50		.65	.65	.65
Janesville, Wis.	.50	.50	(Wisconsin shipments)		.60	
Lafayette, Terre Haute and Richmond, Ind.	.40@ .60	.40@ .60	.40@ .60	.50@ .70	.50@ .70	.50@ .70
Mason City, Ia.	.60	.50	1.45	1.35	1.30	1.25
Milwaukee, Wis.			Railway ballast and road work, .40			
Minneapolis, Minn.	.40	.40	1.20 for all sizes	1.15	1.10	1.00
Moline, Ill.		.60	1.25	1.00	1.00	1.00
Montezuma, Covington, Ind.	.75	.75	1.00	1.00	1.00	1.00
Oxford, Mich.		.55	.85	.75	.75	.75
Saginaw, Mich.	.95	.95	.90	.90	.80	.80
St. Louis, Mo., F. O. B. cars	1.35	1.20	1.60	1.60	1.50	1.35
Summit Grove, Ind.	.75	.75	1.50	1.30		1.25
Terre Haute, Ind.	.75	.75	.75	.75	.75	.75
Toledo, O.			.75@ .85	.75	.75	.75
Wabash Valley District, Ind.			.60 for all sizes			
Winona, Minn.			All sizes, .75.			
SOUTHERN:						
Charleston, W. Va. (River)		.70	1.60	1.10	1.10	1.10
Flomaton, Ala.		1.20	1.30	1.30	1.30	1.30
Knoxville, Tenn.		.80		1.50		
Lake Weir, Fla.	.85	.85	1.35	1.35	1.35	1.10
Pelzer, S. C.	.50					
Roseland, La., and Condron, Miss.	.55					
New Martinsville, W. Va.		.40		1.00		
Waco, Texas	1.00@1.25	.60@ .90		.80@1.00		.50@ .80
WESTERN:		.67	.67	1.25	1.05	1.05
Kansas City, Mo.	.60	.60				
Lincoln, Neb. (on cars)	1.00	1.00	2.10	2.10		1.90
Pueblo, Colo.	1.00*	.60*			1.50*	
San Francisco, Calif.		1.15	1.15 for all grades gravel			
Vancouver, B. C.		1.10*		1.30*		1.10*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.50	.50	.50	.65	.65	.65
Boonville, N. Y.	.65	.45@ .65				.60
Farmingdale, N. J.			Road gravel, pit run, .53			
Pittsford, N. Y.		.50@ .55			.50@ .60	
Yardville, N. J.		.50@ .75				
York, Pa.		1.00@1.10	(crushed rock sand)			
CENTRAL:						
Anson, Chippewa Co., Wis.			.65, all sizes			
Beloit, Wis.		.60			.60	
Covington, Ind.					.60	.60
Des Moines, Ia.		Washed concrete mix., 25% gravel, .70; 50% gravel, .90				
Drake, Mo.						.80
Escanaba, Mich.			1.00 cu. yd., all sizes			
Grand Rapids, Mich.						.50
Hersey, Mich.	.50	.50				.50
Indianapolis, Ind.			Washed concrete mix, .55			
Janesville, Wis.					.55	
Moline, Ill.	.80					
Oxford, Mich.					.85	
Saginaw, Mich.	1.00	1.00	1.30	1.20	1.20	1.20
Summit Grove, Ind.			.50 for all sizes			
Terre Haute, Montezuma, Ind.					.60	.60
Toledo, Ohio						.55@1.00
Wabash Valley District, Ind.			.60 for all sizes			
Winona, Minn.			Pit run gravel under 2-in., .70			
SOUTHERN:						
Albany, Ga.	.60@1.00					
Howcott, La. (50% and up in rock content)						.65
Lindsay, Tex.	1.25			.44		
Waco, Texas				(Road Gravel)		.38@ .48
Rosenberg, Tex.	1.35*	.50*@ .75*				1.75*
Valde Rouge, La.		Sand Clay 50% metal on ⅛" screen, .60 per ton				
WESTERN:						
Pueblo, Colo.	.60		River Run, .60 unscreened			
San Francisco, Calif.		.75				

* Cubic yard. B Bank. L Lake. || Ballast.

Miscellaneous Sands per Ton at Plant

(Continued from preceding page)

Massillon, O.—Steel molding coarse	2.50
Furnace lining	3.00
Millington, Ill.—Core, furnace lining, damp	1.50
Furnace lining, dry	1.75
Roofing	1.75@2.00
Stone sawing	2.00
Mineral Ridge, O.—Core, molding, sand blast, roofing, brass molding, etc., washed, screened	2.00
Montoursville, Pa.—Core, molding fine, traction	1.25@2.00
Brass molding	1.50@2.25
Michigan City, Ind.—Core, bank	.30@ .40
Ohio—Various points:	
Iron molding, fine	1.50@2.25
Iron molding, coarse	1.75
Brass molding, minimum	2.00
Ottawa, Ill.—Brass molding	2.00@2.50
Ottawa, Ill.—Core, Steel Molding	1.75@2.00
Sand blast	2.50
Stone sawing	1.50@3.50
Traction	1.75@2.00
Ottawa, Ill.—Furnace lining, molding fine and coarse	1.50@2.00
Ottawa, Ill.—Roofing	1.75@2.50
Ottawa, Ill.—Sand blast sand	2.75@3.50
Ottawa and Utica, Ill.—Furnace lin'g	.85@2.00
Molding, selected	1.50@2.50
Molding, coarse	1.75
Thayers, Pa.—Core and traction	2.00
Wedron, Ill.—Molding	.75@1.00
West Albany, N. Y.—Molding fine	1.75@2.25
Molding coarse	1.25
Brass molding	1.75
Thayers, Pa.—Molding, fine	1.00@1.25
Molding, coarse, furnace lining	1.00
Zanesville, O.—Molding fine and coarse, brass molding	1.25

Ground Gypsum Rock, per Ton, at Plant

Castalia, O.—Raw rock, crushed, bulk, at 3.00; ground at, bulk	3.50
Fort Dodge, Ia., bulk	3.00
Garhutt, N. Y., in bags	6.00
Grand Rapids, Mich, bags	6.00
Gypsumville, Man., Can	3.00
Oakfield, N. Y.	6.00
Sandusky, O.	6.00

Jute sacks, $3.00 extra; paper, $1.00 extra.

Ground Rock Phosphate at Plant, per Ton

Centreville and Gordonsburg, Tenn.—B. P. L., 72% lump rock, ton, 2,240 lbs.	6.00@7.00
Centreville, Tenn.—B. P. L., 60%	7.00
B. P. L., 70% and 78%	8.00
Centreville, Tenn.—B. P. L., 65% to 70%	7.00@10.00
Jacksonville (Fla.) District—Soft phosphate	10.00@12.00
(Add 2.50 for sacks)	
Mt. Pleasant, Tenn.—B. P. L., 65%	6.50@7.50
Mt. Pleasant, Tenn.—B. P. L., 70% washed (90% thru 100 mesh)	8.00
In 200 lb. burlap bags, 2.50 extra.	
Nichols, Fla.—Pebble—B. P. L. 67%	8.00@10.00
Phoslime. Fla.—Soft	14.00@17.50
Walls, Tenn.—B. P. L., 70%	7.00@7.75

State of Indiana Collects Royalty for Sand

INDIANAPOLIS, Ind.—After taking gravel out of White River under permission of the city and state authorities since 1916, the Capital City Gravel Co. recently was advised that the state claimed ownership of the gravel and sought financial re-imbursement for the material taken out. Charles W. Stevens and Thomas O'Brien, owners of the company, said they obtained permission to dig in the river from the last city administration and the then secretary of state. The matter was negotiated and settled by the company paying $1,500 into the state coffers.

The $1,500 includes $300 which the company paid for permission to take out gravel until June 1, 1920, on the condition that it pay the state additional 10c a load for gravel. The load was limited to one and one-half yards of gravel. The settlement with the company was approved by Governor Goodrich, and Otto L. Klauss, auditor of state.

Stone Sales on Pacific 50 Per Cent Over 1918

OAKLAND, Calif.—All available statistics point to the fact that building is now well under way on the Pacific Coast and rock sales have increased 50 per cent over those of last year.

Seattle, San Francisco, Portland, and Los Angeles are all undertaking great constructive harbor improvements. Docks and warehouses are being provided on a large scale.

Chicago Building-Material Teamsters Ask More Pay

TEAMSTERS AND CHAUFFEURS who work on the wagons and trucks that haul building material in Chicago are demanding less work, more money, and shorter hours. They want $1 a day increase in wages, a nine-hour day, and a helper to handle bricks, sand, gravel, and other material. The Chicago Building Material Exchange has received their demands and is considering them. The present contract expires on July 1.

Building Statistics for May Show Big Gains

STATISTICS OF BUILDING PERMITS for the month of May from 164 cities officially reported to the American Contractor indicate clearly that a "go-ahead" policy for construction is under way. Only 28 cities out of the 164 show a loss compared to last year's statistics, and the total of $105,470,299 for May of this year is a 110 per cent gain over the total of $49,763,085 for the same cities during the corresponding period of last year. This is encouraging when compared to the record for previous months of this year, as the following table shows:

Month.	No. Cities	1919 value.	1918 value.
January	152	$ 23,869,215	$ 27,291,218
February	153	32,058,628	21,680,314
March	199	64,884,325	36,529,620
April	165	84,914,008	44,516,828
May	164	105,470,299	49,763,085
		$311,196,475	$179,781,065

New Zealand Rock Products Men Visiting This Country

TWO RECENT VISITORS OF ROCK PRODUCTS office were T. H. Stewart, general manager of the Milburn Lime & Cement Co., Ltd., and Robert A. Ewing, general manager of the Ewing Phosphate Co., Ltd., both of Dunedin, New Zealand.

These gentlemen are visiting the principal rock products plants in the vicinity of their stopping places. They are more particularly interested in phosphate rock development and preparation, and are on their way to Tennessee and Florida.

Crushed Slag Wholesale at Plant Per Ton

City or shipping point	Roofing	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:							
Buffalo	1.75	.85	.85	.85	.85	.85	.85
E. Canaan, Conn.	3.00	1.25	1.50	1.15	1.10	1.10	1.10
Erie, Pa.	1.75	1.00	1.00	1.00	1.00	1.00	1.00
Emporium, Pa.	1.75	1.00	1.00	1.00	1.00	1.00	1.00
Ensley, Ala.	2.05	.90		.90@1.20	1.00	.90	.85
Philadelphia Dist.	2.50	.75	1.50	.85	.85	.85	.85
Pittsburgh Dist.	2.50	1.00	1.50	1.00	1.00	1.00	1.00
Sharpsville, Pa.	1.75	1.00	1.25	1.00	1.00	1.00	1.00
WESTERN:							
Chicago, Ill.	All sizes, $1.50, F. O. B. Chicago						
Detroit, Mich.	All sizes, 1.65, F. O. B. Detroit						
Toledo, O.	All sizes, 2.00, F. O. B. Toledo						
Youngstown, Dover, Hubbard, Leetonia, and other Ohio points	1.75	1.00	1.25	1.00	1.00	1.00	1.00

Prices of Mixed Fertilizers Coming Down

WASHINGTON, D. C.—"Farmers of the country should obtain their mixed fertilizers for the fall season of 1919 at an average price about 30 per cent lower than that of the spring season just passed," the Department of Agriculture said on June 8, in an announcement giving a list of prices, ranging from $21.75 to $56.25 a ton, for ammonia, phosphoric acid, and potash compounds, to which manufacturers have agreed.

General News From the Rock Products Markets

Some Snags in a Federal Highway System

WASHINGTON, D. C.—Compensation to States for funds already expended in the construction of highways is being strongly urged at the Capitol by Senator Townsend of Michigan, new chairman of the committee on the postoffice and post roads, as a method of overcoming some of the many objections to his scheme for a Federal highway system. Senator Townsend has recently introduced an amended highway measure, under which, he declares, the States will receive a "square deal" on this question by being permitted additional mileage for roads already built.

"Since my first introduction of this bill, I have made a study of the subject," said Senator Townsend recently. "This has convinced me that several changes would be necessary to incorporate the constructive suggestions which have been made from all parts of the country, one of the most important of which relates to the situation in those States where large sums of money have been made available in the past to build main lines.

"Some felt that in the building of a national system it would develop that some of the States had already completed, in a measure, the highways which would form part of that system and that they should not be penalized for having been farsighted and progressive.

"This objection seemed sound to me, and I believe I have met it through the incorporated section in my bill which says that where States have already constructed all or parts of roads so located as logically to form a part of the national system and to a standard deemed by the commission to be adequate, an equivalent mileage of other highways shall be constructed by the Government or by the State under governmental authority.

"These additional highways would not form part of the national system and would not be controlled by or maintained by the Federal Government, but it would be expected that they would connect or coordinate with the national system. Thus the double purpose of recompensing the State and developing the general highway situation would be accomplished.

"For example, it is recognized that New York has spent upward of $150,000,000 in the development of an excellent system of State highways. The same is true, except as to amount, in the States of Massachusetts, Connecticut, Rhode Island, Maryland, and California, and is now being worked out in New Jersey, Pennsylvania, Ohio, Illinois, Wisconsin and Michigan and probably other States which do not occur to me at the moment.

"It must be understood, however, that the work of these States has not met the interstate problem, which, by its very nature, can only be met by the Federal Government, but their intrastate achievements should be recognized wherever they have a bearing upon the working out of the great national problem."

A Little Co-operation Is Needed!

THAT PRICE CUTTING is the last resort of the inefficient salesman has lately been demonstrated to the satisfaction of most sand and gravel producers in central Illinois. Our neighbors in Indiana, by some method of reasoning which is not altogether clear to the men on the outside, appear to consider Illinois as a dumping ground for "surplus" production. The peculiar feature of this class of reasoning or procedure is why should a sane business man have "surplus" production?—"Weekly Bulletin" of the Illinois Sand and Gravel Producers Association.

Can Exchange 3c. Stamped Envelopes for Other Stamped Paper After July 1

WASHINGTON, D. C.—Business concerns and individuals having stocks of 3-cent stamped envelopes or 2-cent postal cards when the change in postage rates goes into effect on July 1, will be protected against loss by the Postoffice Department by being permitted to exchange such stock for other stamped paper.

Orders to this effect have just been sent to all postmasters by the third assistant postmaster general, who is in charge of such matters. Postmasters throughout the country have been instructed to redeem from the public all unused and undamaged 2-cent postal cards and 3-cent stamped envelopes, printed or unprinted, at their full value, including the cost of the envelopes, provided they are convinced such cards and envelopes are presented by the original purchaser.

Postal cards and envelopes will not be redeemed in cash, but are to be exchanged for other postal cards, envelopes or stamps selected by the owner, or the obsolete cards and envelopes may be used in payment or part payment for two-cent special request envelopes.

All exchanges of 3-cent envelopes and 2-cent cards must be made during the month of July. After July 31, the postage value only will be allowed for envelopes and three-fourths of the postage value for postal cards.

Texas Plants Unable to Supply Materials for Big Road Program

AUSTIN, Texas—According to R. J. Windrow, state highway engineer of Texas, there have been voted by the different counties since January 1, 1919, bonds to the amount of $50,000,000, most of which are to be used in the construction of good roads. In addition there are now pending bond issues for the same purpose amounting to $22,000,000, and a state good roads bond issue of $75,000,000 to be voted on November 4. Besides this $147,000,000, assured and prospective, there are big sums from Federal and State funds to be added.

So great is the good roads movement in Texas that the construction materials available are not equal to the demand. An enormous development of gravel pits and quarries are necessary in order to supply the materials necessary for the building of the hundreds of miles of highway that are now planned. Tractors and road graders are being purchased in large numbers to carry on the construction work that is now in progress.

Mr. Windrow says: "The outstanding feature in regard to this enormous sum is the fact that it represents only 94 counties out of 250 counties who can vote bond issues.

"At the present time in Texas there are not over five quarries operating and less than 15 gravel pits that can supply materials in the quantities necessary for economical road construction. The character of the roads being designed is of a higher type than has been used in the past: Crushed stone roads, concrete, and other types of hard surfaces which demand a large and reliable supply of crushed stone and screened gravel.

"It would seem that the matter of materials would be a profitable field for private capital. However, it is one which should not be gone into without considerable investigation.

"It is safe to say that about one-half of the counties considering the construction of roads will find it necessary to ship the greater portion of the materials from outside sources. It can be seen that with the present number of plants operating in the State, all of which are working at the present to capacity, there is little chance of a sufficient supply of material for economical road work.

Quarries

The plant and machinery of the rock crusher at Tehuacana, six miles from Mexia, Texas, has been purchased for about $25,000 by capitalists of Mexia and Teague, says the Dallas News. The output of the plant will be used in building the roads in both limestone and firestone. The good roads were assured for both counties by the recent large road bond issues.

Kaweah Lime Products Co., of Fresno, Calif., has just closed a contract with the Hawaiian Fertilizer Co., Ltd., of Honolulu, for 30,000 tons of agricultural limestone. "After investigating all of the product on this coast," writes A. C. Root, president, the Hawaiian company decided that ours was the best ground and contained the highest amount of calcium carbonate."

British-American Feldspar, Ltd., 43 Victoria St., Toronto, Can., incorporated last year for $100,000, has established its plant at Bobs Lake, Ont. It has purchased tugs, scows, derricks, engines, drills, and is in the market for steam boiler and air compressor. The plant is located on the Canadian Pacific railway and has a capacity of 200 tons of crude feldspar daily. Officers are: President, J. J. Hay; vice-president and general manager, W. Gardner; secretary, J. Lindsay.

Sand and Gravel

H. W. Lackey, 301 Postoffice Bldg., Sheffield, Ala., is said to be planning the construction of a sand and gravel plant and is seeking prices on machinery.

Municipal contracts made during the war may be cancelled by contractors and municipalities may order completion of the work at advanced prices, if a bill passed by the Illinois House a few days ago, becomes a law.

The Shurtliff amendment to the Illinois $60,000,000 bond issue appropriation, providing that 50 per cent of the roads shall be built at a cost not exceeding $18,000, was defeated in the Illinois legislature.

The Egyptian Gravel Co., 1821 Railway Exchange Bldg., St. Louis, Mo., produce "Whittaker Hill Novaculite" obtained in southern Illinois. The vice president, B. K. Leach writes: "We do not handle sand and gravel. We produce nothing but novaculite for road building. This is some times called chert gravel." The other officers of the company are C. A. Clark, president; John Fuhrer, secretary.

Manufacturers

K-B Pulverizer Co., Inc., New York, announces the removal of its office to 92 Lafayette street.

The Sullivan Machinery Co., Chicago, Ill., announces the establishment of a new branch office at Room 810 Park Building, Cleveland, Ohio, under the management of Ralph T. Stone, for several years past sales engineer, associated with the New York office of this company.

The McMyler Interstate Co., Cleveland, O., display in the company's new bulletin, No. 40, data and illustrations of the various types of cranes in use in the ship building industry. The cranes described include the horizontal cantilever revolving of the hammerhead pintle design and the turntable design; boom jib of pintle and turntable designs; standard locomotive and overhead traveling cranes.

The Jeffrey Mfg. Co., Columbus, O., Catalog No. 258, just issued, is devoted to the Jeffrey standard apron conveyors, wood and steel types for every service. Out of the great number of excellent illustrations of actual installations and the tables of specifications, and descriptions that fill the interesting book, any machinery user should be able to find what he wants and needs. The company introduces the slogan: "Handle It Mechanically," in this catalog.

Manufacturers' Publicity Co., is the new name of the Manufacturers' Publicity Corporation, which will be conducted by W. Hull Western as an individual, the company name being a trade name.

The Buckeye Machine Co., Lima, O., announces "the latest development in semi-Diesel oil engine construction" in a pamphlet describing the Buckeye-Barrett heavy oil engine. It is made especially for the use of heavy crude fuel oil and is designed to meet and overcome the ever mounting cost of operating engines. In listing the special features, the company enumerates sixteen. Particular mention is made of the new clutch mechanism, "a new principle in the application of power from the Buckeye-Barrett oil engine."

Cement Gun Construction Co., engineers and builders, 900 South Michigan avenue, Chicago, assert "We Do The Work" in their Gunite book No. 6, devoted to an exposition of the manner of applying Gunite for walls, roofs, for waterproofing and fireproofing with the cement gun. "Gunite," the book says, "is concrete applied by the cement-gun process, and is composed of cement and sand of various grades and proportions. The material is delivered into the gun as a "dry" mixture and blown or shot by pneumatic pressure to the place of deposit. The necessary water for the hydration of the mixture is added as the material rushes through the mixing nozzle." The pamphlet is filled with illustrations of how it is done and shows structures of all kinds in process of construction on which gunite is being used.

H. Channon Co., Chicago, Ill., issues a catalog of machinery, tools and supplies that seems to meet every inquiry a user of machinery might make. Whatever the need a description and probably a picture of the article needed will be found on one of the 1,150 pages. There is much in it that the producer of rock products uses in his business, such as car movers, wire and other rope, hoists, cranes, pulleys, buckets, conveyors, belting, railroad track scales, air compressors, drills, engines, boilers, janitors' supplies, electric and steam machinery. The index takes up 36 pages alone. There are 38 pages of useful information for engineers, machinists and superintendents. The company is a manufacturer as well as jobber. A discount book for this catalogue comes separately.

Pierce-Arrow Motor Car Co. employes of Buffalo, N. Y., recently staged a most impressive Memorial Day tribute to the 2,200 factory men who served in the war. They unveiled a big bronze tablet sunk permanently into the front wall of the administrative building. The allegory expressed in bronze shows a skilled automobile worker laying down his tools to accept the sword of justice from the Spirit of Liberty. About 900 men who have returned from service to their positions in the shops donned their uniforms and marched in battalion form to the scene of the unveiling. The tablet was erected by the employes, who freely subscribed to a fund to cover its cost. It was designed by Major Herbert M. Dawley, himself a Pierce-Arrow man, having been the company's art department manager for several years before responding to the call to colors.

Incorporations

The Lime Rock Crusher Co., Malone, R. D. No. 38, Wis. R. Peter Birschbach, John P. L. Birschbach, Will H. Seibel. $3,000 stock.

Raeder Sand and Gravel Co., Canton, O., $150,000; L. D. Blanchard, R. C. Flack, Edward W. Markling, Edward W. Morrow and Clifford Morrow.

Oil City Silica Sand Co., Oil City, Pa.; capital, $300,000. To quarry and mine sand, sandstone, rock, etc. George C. Magee, Elizabeth Magee, Albert W. Kauffman, all of Oil City, Pa.

Hydraulic Stone Corp., Brooklyn, N. Y.; stones, brick and ceramic ware, $20,000; M. E. Jenkins, F. Knauss, A. L. Carroll, 188 Adelphi St., Brooklyn.

Personals

C. B. Rogers has been appointed assistant treasurer and credit manager of the Lehigh Portland Cement Co., Chicago, Illinois, in place of W. E. Viets who has resigned.

L. L. Gerstenberger, formerly sales manager of the Main Belting Co. at Philadelphia has recently been made assistant general sales manager of the Imperial Belting Co. He will be located at the general office, Chicago.

Charles G. Sherman, formerly manager of the Atlanta, Georgia, branch of the Main Belting Co., is now connected with the Imperial Belting Co., Chicago, and will make the general offices his headquarters.

Major D. D. Guilfoil has returned to his old position as sales-engineer for Sauerman Bros., Chicago. Major Guilfoil commanded the 1st Battalion of the 108th Regiment of Engineers. This regiment, which was composed almost entirely of Chicago men, participated in two major operations in France, the Somme and Meuse-Argonne offensives. Major Guilfoil received his discharge at Camp Grant on June 7 and resumed his old job on June 9.

Lime

Clifford L. Miller, manufacturer and distributor of lime and lime products, 280 Madison ave., New York City, has recently added a pulverizing plant for making agricultural limestone to his lime plant at West Stockbridge, Mass. The stone runs 95 to 98½ per cent calcium carbonate equivalent. Only one grade of material is produced. This is pulverized so that 100 per cent passes a 40-mesh screen, 66 per cent a 100-mesn and 33 per cent a 200-mesh. During the two months the plant has been operating a considerable trade has been developed in the Hudson River valley and in New England. Mr. Miller is now busy establishing agencies in different counties and in some cases turning over these agencies to old established fertilizer firms. The material is sold in bulk and in returnable cloth sacks. Mr. Miller is well known to the lime trade as a manufacturer of wall plaster, finishing lime and as an importer of Keene's cement. W. C. Carr is sales manager, West Stockbridge, Mass.

Gypsum Products

The United States Gypsum Co. will offer for sale 6,000 shares of 7 per cent cumulative preferred stock. This will bring the total of the preferred issue outstanding up to the authorized amount, $6,000,000, and make the total capitalization $10,000,000. The proceeds of the sale are to be used for increasing the productive facilities of the company in order to take care of the increase in its business which has come with the resumption of building activity.

Retail Dealers

The Pittsburgh Builders' Exchange of Pittsburgh, Pa., will hold an outing at "The Pines," Perrysville road, Thursday, June 26.

Cement

The cement plants of Lehigh Valley are filling up with orders and several new quarries are being opened, says the Philadelphia Record.

War Improvement in Wireless Telegraphy Greatly Increases Demand for Mica

THE WIDE USE OF WIRELESS telegraphy has given a great impetus to the production of high-grade mica, according to report by Samuel Bowles, of the United States Bureau of Mines. Prior to 1915 most radio sets were equipped with Leyden jar condensers, but subsequently mica condensers, as perfected by William Dubilier, have largely replaced them. Mica condensers consist of 1,000 or more sheets of mica, alternating with sheets of foil, the whole being enclosed in an aluminum case. They have the advantages of low power loss, small volume, and durability.

As a result of the imperative demand for radio sets for military purposes about 50,000,000 sheets of mica were used during one year of the war. With the return of peace the wide application of wireless telegraphy to commercial uses will undoubtedly command a strong and steady market for condenser mica.

Condenser mica must be of the highest quality. It must be free of iron compounds, air bubbles, pin holes, cracks or other defects or impurities that impair its dielectric strength. In this connection it is of interest to mica producers that for the most exacting demands in condenser manufacture high-grade domestic muscovite compares favorably with India or other foreign mica. It is claimed, however, that as a rule the domestic product is less carefully trimmed and graded than the imported material, and is on this account less in demand. With the assurance that domestic mica possesses essentially the same inherent qualities as foreign mica for this new and important use, it is to be regretted that the method of treatment places it on an unfavorable commercial basis.

The Bureau of Mines offers the suggestion, therefore, that mica miners and manufacturers give careful study to the question of trimming, grading and classification, and make every effort to prepare their products in forms favored by users of manufactured mica.

Figures compiled by the Department of Commerce indicate that imports of mica for the month of April, valued above 15 cents a pound, totaled 62,437 pounds valued at $50,200. Imports of cut mica, mica splittings, and built-up mica for the same period were valued at $41,180.

CLASSIFIED ADVERTISING

Rates for advertising in the Classified Department: 2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

Plants for Sale

FOR SALE—Half or whole interest in 18 acres best Agric. Lime Quarry; 20 ft. breast. Switch connections to L. N. R. R. Fully equipped for business. Demand for all product at good price, at quarry. Come and see. Frank Dittbenner, R. F. D. No. 3, Franklin, Ky.

FOR SALE

Plant and good will of sand lime brick business. Located in Central Mass. on R. R. siding. Capacity, 23,000 per day. Finest of sand and gravel in center of best of markets. Address

BAY STATE BRICK CO.
Indian Orchard Massachusetts

Lime Plant For Sale

A working Lime Manufacturing Plant and Stone Crusher. Situated in Upper Merion, Montg. Co., Pa. For particulars address

W. P. DAVID ESTATE
309 W. School Lane Germantown, Pa.

FOR SALE

Crushed stone plant near Wymore and Blue Springs, Neb., on Union Pacific and C., B. & Q. railroads; the quarry farthest west in Nebraska or Kansas; 40 ft. of stone; light stripping; large territory; good prospects; 67 ft. of shale under quarry bed. Ideal location for fancy brick or Portland cement plant. Address

G. H. DAVIS, Blue Springs, Neb.

Steatite Deposit for Sale

Will sell, or lease on royalty, property containing valuable deposit of Steatite (Soapstone). Slate and Serpentine also present. Address

Box 1316 Care of Rock Products

Help Wanted

WANTED

Quarry Foreman. One thoroughly familiar with handling powder, in the economical breaking up of sandstone. Answer by letter, giving age, experience, references and salary expected, to

Leesburg Silica Sand Co., New Castle, Penna.

We Want Experienced Building Supply Man

Our lumber and building supply business has grown to such proportions that we need an experienced building supply man to take complete charge of that department. If you have some capital, so much the better. Liveliest city of 100,000 in middle west. Address

Box 1315, Care of Rock Products

WANTED

Superintendent to take charge of Sand and Gravel Pit. Good position to one that understands machinery and has had practical experience in a Sand Pit. Good salary to right party. Address

Box 1314 Care of Rock Products

MARBLE MAN

The Colorado Marble Company wants man of experience and ability to open and manage quarry and take interest in company. Quarry fully equipped with railroad and machinery. Address

COLORADO MARBLE CO.
215 Keith & Perry Bldg., Kansas City, Mo.

WANTED

Experienced Traveling Salesmen acquainted with building supply dealers in territory east of Illinois. State age, references and salary wanted. Address

Lock Box 743 Uhrichsville, Ohio

MAN WANTED

Desire to communicate with man experienced in lime burning and hydrating, both dolomite and high calcium. New plant in Rocky Mountain West. State experience and salary desired. Address

Box 1313 Care of Rock Products

Wanted: Superintendent

One who has experience and ability to develop high efficiency and increase production. Good position and salary for the right man. Plant located at Racine, Wisconsin. Location and operating conditions very good. In answering, state age, experience, and give reference and salary expected.

RACINE STONE COMPANY
134 South LaSalle St. Chicago, Ill.

Situations Wanted

SUPERINTENDENT desires engagement with reputable company where ability and thorough knowledge of quarrying is recognized in the performance of efficient operation. References. Address Box 1310, care ROCK PRODUCTS.

USED EQUIPMENT

Rates for advertising in the Used Equipment Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

No. 12K Gates Crusher, Manganese fitted, nickel steel shaft, $5600.00.
10—Crushers, Nos. 2 to 12, mostly Gates.
2—1500 cubic foot duplex air comp.
1—2570 cubic foot comp., 2 stage, with 3 Ph. 500 H. P. motor, 2080 V., G. E.
1—375 Kva., 2300 V., 60 Cy., 3 Ph. turbo.
1—Tan. Comp. Corliss, 375 Kva., 2300 V., 60 Cy., 3 Ph., 100 Rev. Fine condition.
2—326 H. P., 180 lb. hor. water tube boilers, $9 H. P. Fine condition.
Send us your inquiries for used equipment.

ROSS POWER EQUIP. CO.
Indianapolis Indiana

FOR SALE

No. 3 Double Screen Newago Separator. Screening surfaces 8′ x 6″. This is a practically new machine at the price of a second hand one.

The Orford Soap Co.
Manchester Connecticut

PRIVATE EQUIPMENT

Bucyrus Shovel, 65 ton, 2½ yd., on railroad trucks.
Bucyrus Shovel, steam traction, ½ yd. dipper.
Locomotive, standard gauge, 35 ton.
Duplex Compound Piston Pump, 3,000,000 gals. per day.
Milwaukee D. C. Generator, 8½ K. W., complete.
Tractor, Holt Caterpillar, 75 H. P.
Laidlow Dunn Gordon Compressor, 420 ft., belt driven.
Franklin Compressor, 530 ft., steam.
Drag line, caterpillar, ½ yd. dipper.
1800 ft. track, cars and locomotive, all 36″ gauge.
6000 ft. track, cars and locomotives, all 24″ gauge.
Blake Jaw Crusher, No. 5.
10 ton steam roller, 3 wheel.

D. B. STRALEY, Crown Point, Ind.

WANTED

10 36″ gage V shape all metal 2-way rocker side dump cars. Send full description, photographs, price. Address

Box 1308 Care Rock Products

WANTED TO BUY

2 steel bins for tube mills.
1 steel bin for ball mill.
2 steel bins for rotary kilns.
1 tube mill, 6′x22′.
No. 8 Ball Mill.
1 No. 85 Kominuter.
2 Ingersoll Tripod drills number E44.
16 3 Yard End Dump Cars, 36″ gage low wheels.

Gulf States Portland Cement Co., Mason City, Iowa

WANTED

Screen 16′, 18′ or 20′ long, 48″ in diameter, 1½″ mesh for gravel and ¼″ mesh jacket. Must be in good condition.

BUILDERS MATERIAL & SUPPLY CO.
521 Ashton Bldg. Rockford, Ill.

Idle Machinery Absorbs Profits

This department is the medium for the men who keep the wheels going. Sell your idle machinery to the man who'll keep it going.

Repaired Contractors' Equipment

Steam Shovels

Model 60 Marion Shovels, 2½-yard dippers, Nos. 1999, 2059
Model 75 Marion Shovel, 4-yard dipper, No. 2191
Type "B" Erie Revolving Shovel, ¾-yard dipper, No. 256
Model 18 Osgood Shovel, ¾-yard dipper, No. 375

Locomotives

4—18-ton 10 x 16″ Dinkeys, 36″ gauge
2—12-ton 9 x 14″ Dinkey, 36″ gauge
1—10-ton, 7 x 12″ Dinkey, 36″ gauge

Cars

20—12-yard Western Air Dump, standard gauge
75— 4-yard Western Steel Beam, 36″ gauge
25— 4-yard Oliver and K. & J. Wood Beam, 36″ gauge
1—Western narrow gauge hand operated Spreader

Clam Shell Buckets

2—1-yard Owen
1—1-yard type "E" Blaw
1—¾-yard Owen

Hoisting Engines

1—8½ x 10 DC 2-D Lambert, with boiler
1—7 x 10 DC 2-D Lidgerwood with swinger, no boiler
1—6¼ x 10 DC 2-D Mundy, with attached swinger and boiler

Cableway

1—Lidgerwood Cableway, 1164-ft. span, with 9 x 10″ DC Reversible Link Motion Cableway Engine, 3-ton capacity

We have a large stock of thoroughly repaired Construction Equipment of all kinds ready for immediate shipment.

H. KLEINHANS COMPANY

Union Arcade Pittsburgh, Pa.

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.

USED EQUIPMENT

RAILS

All sections of new and second-hand, on hand for quick shipment. Also purchase old and abandoned plants for dismantling purposes.

M. K. FRANK, Pittsburgh, Pa.

FOR SALE

Brand new Kennedy No. 5 gyratory crusher and plunger feeder, complete. Are selling on account of not being able to open rock quarry as contemplated. Will sell at considerable reduction. Address

LYCOMING SILICA SAND COMPANY
Montoursville, Pa.

CRUSHERS

1 No. 4-C Symons Gyratory.
1 No. 6 Austin Gyratory.
1 No. 7½ Austin Gyratory.
1 No. 8 Gates Gyratory.
1 16 x 24 Buchanan Jaw.

BOILERS

1 66 x 16 Horizontal Tubular.
1 72 x 18 Horizontal Tubular.
3 125 h.p. Locomotive Type.
1 275 h.p. Heine Water Tube.

WIRE ROPE

10 pcs. 1⅝-in. Plow Steel, 650 ft. lengths.

Rails, Cars, Locomotives, Hoisting Outfits, Road Rollers, Concrete Mixers, Compressors, Etc.

ZELNICKER IN ST. LOUIS

Get Bulletin 250—(250,000 Circ.) 88 Pages

FOR SALE

one 18-inch Bonnot Pulverizer, strictly first class order, immediate shipment

John D. Owens & Son Co.
Owens, Ohio

For prompt and satisfactory results in buying or selling a plant; securing help or a position, use the Classified Department of ROCK PRODUCTS.

Wanted

One or two 4 yard side dump Standard Gauge cars. Also one hand car. Must be in first class operating condition.

RACINE STONE COMPANY
134 South LaSalle St. Chicago, Ill.

Daily Shipping Capacity **140,000** *Sacks*

MORE THAN FIFTEEN YEARS OF SATISFACTION

GREAT WATER AND RAIL FACILITIES BEST SERVE THE ENTIRE MIDDLE WEST
FIVE PLANTS: ALPENA, DETROIT, WYANDOTTE, CLEVELAND AND DULUTH

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EVERY BARREL TESTED AND GUARANTEED
SOLD BY THE BEST DEALERS USED BY THE BEST BUILDERS

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Rock Products

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For Mortar, Cement and Brick—Brown, Black, Red and Buff —Strongest and Most Durable

Manufactured by

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Correspondence Solicited EASTON, PA., U. S. A.

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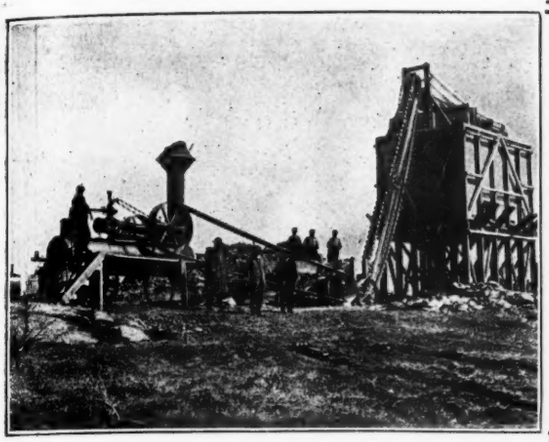

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For Stone Quarries or Lime Plants

We are prepared to build and superintend the installation of all equipment necessary to start operations.

Reliance Products are equal to the best and we know that our engineers can save you money by their recommendations. Prompt deliveries.

Let Us Quote You Prices

Universal Road Machinery Co.
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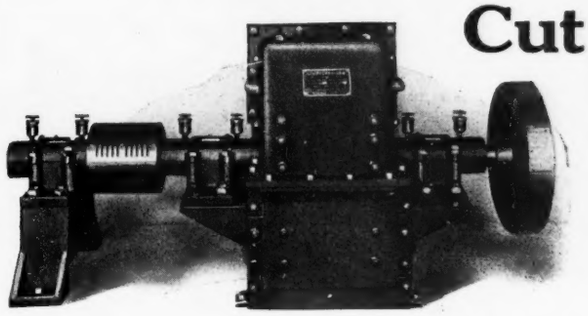
Reliance Quarry and Road Building Equipment



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If you haven't heard what the

K-B PULVERIZER

is doing for others in cutting down running expenses by using less power, let us send you figures on what you want to crush.

Built entirely of steel the "K-B" will pulverize the hardest kind of shale and toughest of clays with ease.

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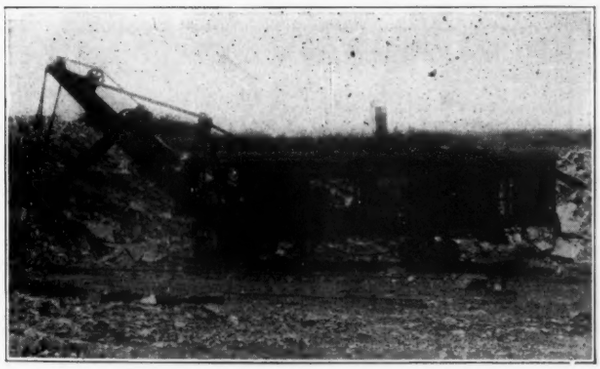
K-B PULVERIZER COMPANY, Inc., 92 Lafayette St. NEW YORK

K-B PULVERIZER



Osgood-73, in Heavy Quarry Work

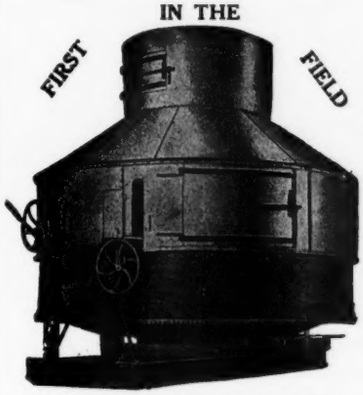
THE OSGOOD 73—3½ yard steam shovel is designed throughout for the heaviest kind of service. It meets demands where maximum strength is required and severe work to be done, such as found in iron mines, rock works, etc.

It has all the features in good steam shovel construction which embody steel gears with machine cut teeth; manganese racks and pinions for dipper handle; cast steel swinging circle; heavy front end construction; especially strong boom; large boiler and water tanks; long car frame; enclosed firing platform; steam hoisting friction; by-pass throttle, etc.

We will take pleasure in furnishing you on request complete information on any of the different size shovels we build, which range from ¾ to 6 cubic yard capacity

Write today for copy of our New General Catalog C-1

THE OSGOOD COMPANY, Marion, Ohio



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THE CLYDE LIME HYDRATOR

The simplest and easiest to operate. The most economical in Installation, Maintenance and Operation. Makes a **perfect hydrate** of either High Calcium or Dolomite Lime.

Price, per ton capacity, only three-fifths of any other Hydrator on the market.

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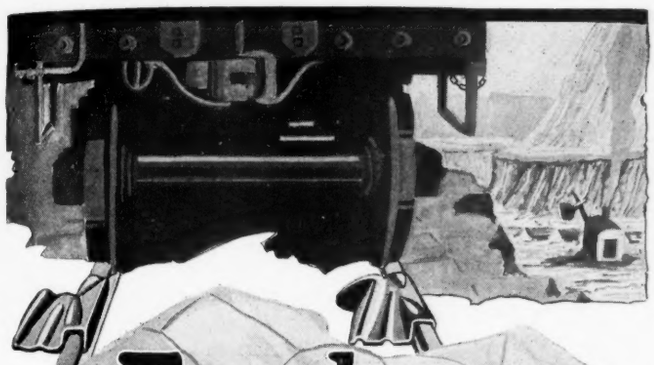

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CAR REPLACERS

have the combined correct construction, strength, lightness and simplicity to serve you most efficiently in your quarry or pit. Minutes lost mean dollars lost. A few derailments and the Fowler Replacer has paid for itself.

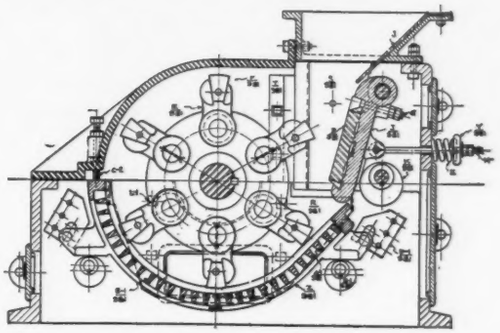
Fowler Pressed Steel Replacers work quickly and very easily. No "rights" or "lefts." Can either pull or back up to proper position. No spikes—just place them over the rails and the car MUST re-rail.

Engine and all can run right over Fowler Replacers without damage to them. Made in different sizes to suit individual requirements.

GET Fowler literature. It gives prices and sizes. Try them. If they fail to suit you, return them and we will immediately refund full price. You take no chances.

Track Equipment Company
HUNTINGTON, W.VA.

THE KENNEDY
Swing-Hammer Pulverizer



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The Kennedy Swing-Hammer Pulverizer embodies mechanical improvements heretofore considered unattainable. Reversible, renewable hammer tips and breaker plates of alloy steel. Impact pulverizing—no grinding movement. Adjustable steel grid—so controlled as to permit adjustment while machine is running. Automatic lubrication. Ball and socket bearings—in short, every possible improvement tending toward efficiency, durability and low maintenance expense.

Send for full description

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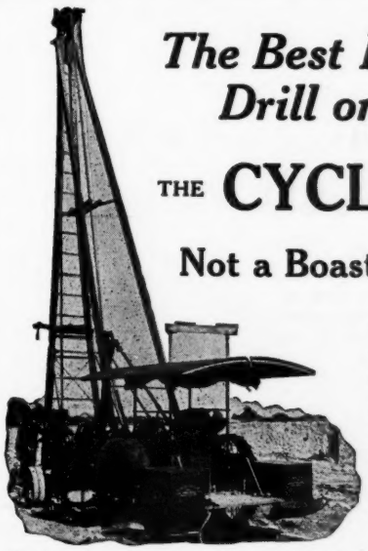

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Not a Boast—A FACT

We will prove the superiority of the No. 14 Drill by placing one of the outfits in your quarry against any or all other makes.

If the Cyclone doesn't out-drill and out-wear all other drills, we will remove it from the work without cost to you.

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Furnished in Steam, Gasoline, Compressed Air or Electric Power Traction or Non-Traction

Let us send you full particulars

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Ask for Folder 1918

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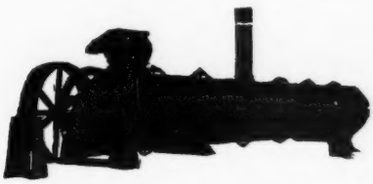

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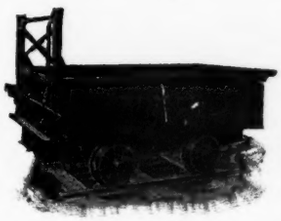
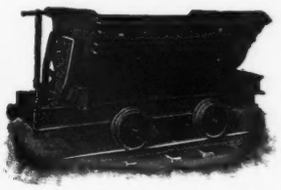


No. 274
End Dump Quarry Car



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Where a trolley wire or third rail is undesirable investigate our storage battery locomotives. Made in several styles and sizes. Cars to suit every requirement.

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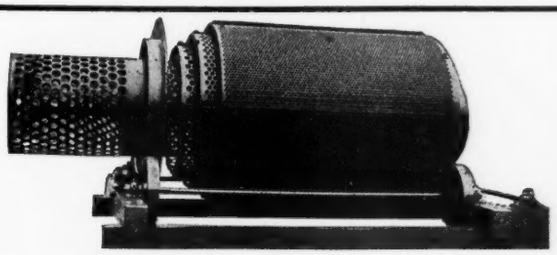
DUST JACKETS

Made to Fit All Makes and Sizes of Revolving Screens



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Sand and Gravel Screens

CYLINDERS SCREEN PLATES
CONICAL SCREENS

EVERYTHING IN SCREENS

QUICK SHIPMENTS

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THREE ROLL MILL

YOUR best opportunity to increase the products of the land by providing agricultural limestone is obtained by installing the BRADLEY THREE-ROLL MILL, which produces a perfect limestone powder **most economically.** It takes ¾ inch material (or smaller) and reduces it to a uniform, finely ground material in one operation. This result is accomplished at a **lower price** than is obtained by many mills which turn out **coarser** material.

We will send full particulars and prices. Our engineers are at your service. Engineering of Agricultural Limestone Plants a Specialty

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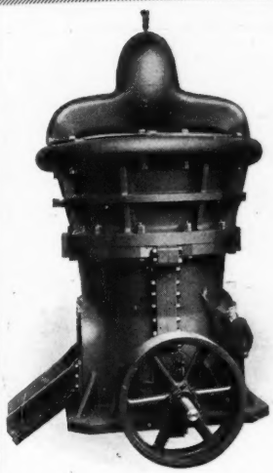

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Easily the first machine in every field whether quarry, mine or mill.

Years of practical operation under every conceivable condition backed by fundamentally correct design have made the Allis-Chalmers Gates Type-K the standard of the world.

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Our name is your assurance

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NATIONAL Screen Separator

The Leading Screen in

Efficiency
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There are many years of manufacturing experience back of every Leschen Wire Rope, which insure a product that is uniform and durable.

We make Wire Rope for every kind of wire rope service. If you will tell us how you use wire rope we will be glad to suggest the correct rope for the work.

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